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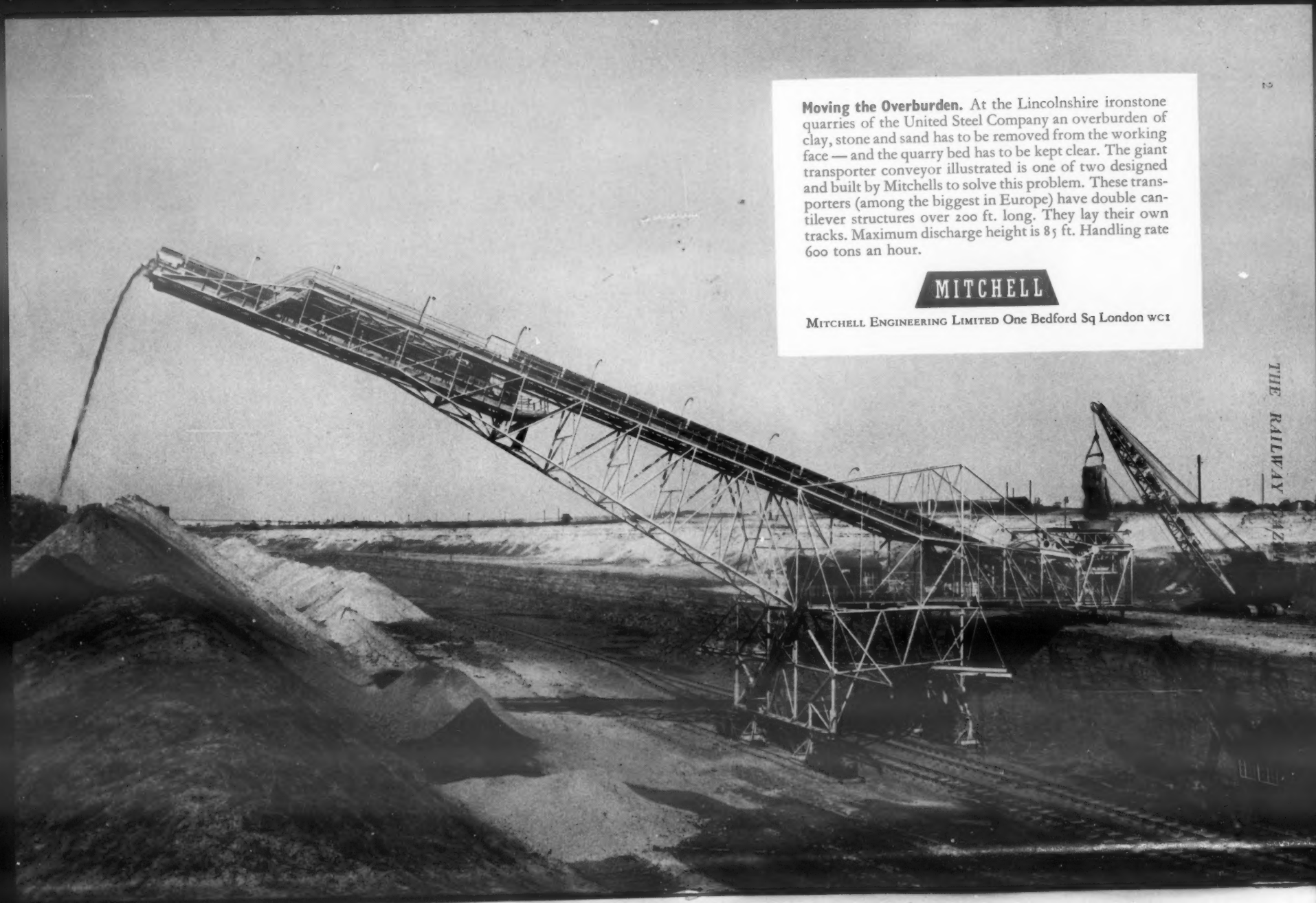

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B.T.C. Freight Charges Scheme Confirmed

BY an order dated December 31, 1956, the Transport Tribunal has confirmed the British Transport Commission (Railway Merchandise) Charges Scheme as amended by the Tribunal ; the amendments were discussed in our issue of August 3, 1956. The scheme is to come into force on July 1, 1957, and will be published as soon as possible by H.M. Stationery Office. The published document will contain four parts, dealing respectively with citation, interpretation, and commencement ; charges, in four sections ; terms and conditions of carriage ; and the method of publication at stations of the scheme itself, maximum charges, and other relevant matter. There will also be three schedules, dealing with maximum charges, miscellaneous services and facilities, and modifications of the standard terms and conditions of carriage. The scheme was submitted to the Tribunal for confirmation on March 21, 1955, and it will therefore have been some 27 months from that date before the new charges come into force and the Commission is able to apply the commercial methods of charging which are essential to the financial recovery of British Railways. The Commission is shortly to consult with trading interests on the methods which it proposes to adopt to implement the new scheme. When the draft scheme was issued in 1955 the Commission stated that it intended that most of the rates in active use at the time the scheme came into force would continue in operation for the time being to allow a review of all such rates to be made. The consultation with traders now to be held was also promised at that time. The Commission has no doubt accumulated a great deal of evidence in the intervening period which will enable the rates to be changed more quickly than was envisaged originally, and this should also help to speed up the consultations. It should also be possible to prepare more rapidly the " price lists " which the Commission proposes to keep for the information of interested traders.

New Year Honours

NO improvement is to be seen over either of last year's lists in quantity or quality of the New Year honours awarded to those directly or indirectly connected with the transport industry. It is true that Mr. A. F. Kirby, General Manager, East African Railways & Harbours, receives a well-deserved K.B.E., and that this honour has also been awarded to Mr. G. F. Stedman of the Ministry of Transport. Also that heavy industry as a whole receives recognition with Sir Archibald Forbes's G.B.E. and the Knight Bachelorhood of Mr. J. F. Pascoe, Chairman & Managing Director of British Timken Limited. Mr. J. C. L. Train, Member of the British Transport Commission, also becomes a Knight Bachelor, and Mr. J. A. Fargher, Railways Commissioner, South Australian Railways, receives the C.M.G. Representative of the recognition deservedly bestowed on the industry and value of the Crown Agents is the C.B.E. for Mr. D. C. Brown, Chief Mechanical Engineer. British Railways has not been so fortunate—the highest honour given is an O.B.E., to Mr. G. F. Fiennes, Operating Superintendent, Eastern Region. The Eastern gets one other award—a B.E.M., the Southern, an M.B.E., and the Western, one of each. Some other railway systems at home and abroad are not even this fortunate.

Chairman's Message to B.T.C. Staff

IN a Christmas and New Year message to British Transport Commission staff, Sir Brian Robertson, the Chairman, declares that the diversion of traffic from the roads brought about by oil and petrol restrictions affords at once a challenge and an opportunity to British Railways and British Transport Waterways. " I appeal to you," he writes, in a special message to railwaymen, " with all the force at my command, to grab it and hold it." It will mean, he emphasises, hard work, a refusal to be defeated by difficulties, and working while others enjoy themselves. The full effect of traffic diversion is expected to be apparent in January, when the weather is often at its worst and has the maximum effect on traffic movement. Sir Brian Robertson, rightly, has no doubt that, despite this, the railways will be able to satisfy the travelling public and convince trade and industry that railway services are as good as or better than those offered by any competitor. By their efforts, British Railways can attract and keep, even when road transport has returned to normal, traffic which is now passing through their hands for the first time.

A Great Austrian Locomotive Designer

THE death recorded in our personal columns in this issue of Dr. Johann Rihosek, at an advanced age, removes a figure long well known in Central European railway circles, not only for his own designs of engine but for his close association for several years with that other eminent locomotive engineer Karl Gölsdorf, the products of whose skill, many of which were of handsome appearance, worked the trains over the extensive routes, often very difficult to operate by reason of the gradients and other local conditions, of the former Austro-Hungarian monarchy. Rihosek imbibed and carried forward in every respect most worthily the Gölsdorf tradition. He was a great authority on brakes and played a large part in the

development of the vacuum system, so long much favoured in Austria, but also contributed to the improvement in due course of compressed air equipment. He lived to see electric traction displace, on considerable lengths of route, the steam locomotives which Göldsdorf and he, by the careful application of every resource science could offer them, brought to a particularly high level of efficiency, admirably adapted to conditions in their part of Europe.

Overseas Railway Traffics

OPERATING revenues of the Canadian National Railways for the month of November amounted to $65,951,000. Expenses, taxes, and rents totalled $62,157,000, making the net operating income for the month $3,794,000. For November, 1955, operating revenues were $61,613,000; expenses, taxes, and rents were $57,799,000; and the net operating income was $3,814,000. For the 11 months January-November, 1956, the aggregate net operating income of the C.N.R. was $47,974,000 ($36,504,000). Canadian Pacific railway revenues for November were $42,999,000 (against $39,637,000 for November, 1955) and railway expenses $38,694,000 ($34,580,000), so that net earnings were $4,305,000 ($5,057,000). The aggregate net railway earnings of the C.P.R. from January 1 to the end of November, 1956, were $37,332,000 ($32,680,000). Costa Rica Railway receipts for November were colones 1,580,000, compared with colones 1,866,000 for November, 1955; the aggregate receipts for the four months July-November were colones 7,867,000 (8,043,000) International Railways of Central America net revenue from railway operations in November was $240,000, compared with $168,000 in November, 1955. The aggregate net revenue from railway operations for the 11 months January-November, 1956, was $2,473,000 ($2,735,000).

New Equipment and Processes

DESCRIPTIONS of equipment and processes designed to increase efficiency in one or more of the manifold activities of railway engineering and operation have long been published in this journal, on their being placed on the market. On another page this week several such descriptions have been grouped together for easy reference, with information where possible as to prices and periods of delivery, as a new feature, "New Equipment and Processes." It has been started in the belief that the constant need for lowering costs, more especially by minimising manpower requirements, has made it necessary for railway officers, especially those in charge of works and depots, and manufacturers of railway equipment, to take every opportunity to find what new techniques and equipment they can use, and that information presented week by week in a compact form will help them in their search. We are confident that the feature will gain in usefulness as manufacturers are increasingly prompt to advise details of their new products, their prices, and delivery dates.

Four Thousand Turned Away

THE enthusiastic view of British tourism taken this week by Thos. Cook & Son Ltd., while encouraging as showing an estimated improvement even on last year's record figures, is marred by the report that agencies are unable to place more than 3,000 out of the seven thousand Americans during a Bar Convention to be held in London this July. Despite every effort, including that of persuasion towards "annexe" accommodation on the South Coast—an area itself never free of excess visitors during the High Season—four thousand have had to be turned away. That these American visitors may generally be assumed to be combining their annual holiday with attendance at the Convention will not be disputed, nor that the disappointed majority may turn to the Continent for the accommodation they are unable to secure here. The hotel industry is not to blame for this lamentable state of affairs—operating under supremely difficult conditions, including that of constant renewal of equipment at sharply-increasing prices, its new accommodation may only be made available after the expenditure of a great deal of money. Profits and new capital, from which improvements and construction must be found, are obtainable only by offering highly competitive value. While a good case might be made for Government financial help, equally cogent arguments exist for every other vital industry now operating under similar difficulties. But the release by the Government of requisitioned hotel properties now occupied as offices is a measure with which few would quarrel. The sleeping accommodation of the four great London hotels so used—the Carlton, Metropole, South Kensington, and Grand Central, constitutes over 1,000 beds, a figure one-quarter of that required to satisfy the American Convention's unmet demands.

Electric Services to Southend

THE start of electric operation between Liverpool Street and Southend-on-Sea Victoria last Monday marks the completion of the 1,500-V. d.c. electrification which reached Shenfield in 1949 and Chelmsford on June 11 last year. The service provided by the four-coach sets specially built for the route gives almost twice as many trains as before—119 on weekdays compared with 64—and they are considerably faster, some trains taking only 55 min. for the 41¾ miles. British Railways, Eastern Region, are to be congratulated on the spectacular improvement brought about on the route via Shenfield. When electrification of the London, Tilbury & Southend route is completed in 1961, Southend and adjacent communities will be provided with passenger train facilities for the large residential populations and many holidaymakers of exceptional frequency and comfort. The new train sets on the Shenfield route are not only fast, but comfortable, with 38 first and 688 second class seats in a standard two-set train of eight coaches. The combination of compartment and open saloon stock forming the trains is calculated to meet the diverse requirements of residential and holiday travel. Descriptions of the new rolling stock and other equipment and of the opening ceremonies are given elsewhere in this issue.

Increased Traffic with L.M.R. Diesel Sets

INCREASED passenger traffic on all the services now being operated by multiple-unit diesel trains, compared with conditions which pertained a year ago, in most cases under steam operation, is shown in figures issued by the London Midland Region. The percentage increase for the Banbury-Buckingham branch is given as some 430; this covers only the first few weeks of operation, from August 13 to October 31 of this year. A description was given in our issue of August 10 of the special experimental single-unit diesel railcars, designed for branch lines of this type. Percentage increases in passenger traffic over lines now worked by diesel trains in other districts, for periods ending October 31, 1956, also are shown. From February 1, 1956, the increases for West Cumberland and Watford-St. Albans services are 1·4 and 22 per cent; from February 6, for the Bury-Bacup service 152 per cent; from March 5, for the Blaenau Ffestiniog-Llandudno and Birmingham-Litchfield services 39 and 178 per cent, respectively; from May 28, for the Bangor-Amlwch branch 26 per cent; and from October 8, for Manchester-Buxton-Macclesfield the increase is 38 per cent. This is certainly an encouraging beginning in the operation of diesel railcars in this country on a wide scale and for different types of service.

New Format for "British Railways Magazine"

THE first to reach us of the six Regional editions of the January issue of *British Railways Magazine* in its new format is that of the Western Region. The changes, described by "The Man on the Line" as "part of our own particular modernisation plan" in his editorial note in what remains the front, "all-line" part of the periodical, consist mainly of a reduction in the size of the page, improvements in typography and layout, and

separate front covers for the Regional editions bearing panels in the Regional colour and illustrations of particular, Regional interest. They are in accordance with the wholesome trend towards autonomy; it is perhaps appropriate that the Western Region, which rightly and sturdily champions the cause of independence in these matters, should have been the first to get its edition into print—shortly before Christmas. All concerned are to be congratulated on the new production. The Western Region edition contains an article, "How's the Shop Doing?" of interest to all railwaymen concerned with passenger traffic, in emphasising the importance of good service to the traveller, and of cleanliness and attractiveness of stations and rolling stock in securing the goodwill of British Railways' customers.

Closure of the Liverpool Overhead Railway

ON Sunday last, December 30, the last trains on the Liverpool Overhead Railway began their journeys simultaneously from Dingle and Seaforth Sands at 10.3 p.m. after a day of heavy traffic through many people making sentimental journeys, and at 10.30 p.m. the line was closed. This was in accordance with the formal notice given by the company a month earlier under the powers of its Act of August 2, 1956. There were the usual fusillades of detonators, but no formal ceremony, and apparently no riotous scenes. On Monday morning some 44 buses of the Liverpool Corporation Passenger Transport Department inaugurated a replacing service, described by a local newspaper as "the finest bus service ever known on Merseyside," but apparently provided at the expense of other bus services in the city. For many passengers the fares are higher than those on the railway, and for dock workers the stops are less convenient. Local efforts are still being made to secure a resumption of rail service, and invitations have been sent by the Town Clerk of Liverpool to 28 local authorities, commercial associations, and trades union organisations to a meeting to discuss the future of the railway. Many of the railway staff have gone to other jobs, some with British Railways.

Mr. H. H. Phillips

THE appointment of Mr. Herbert H. Phillips as a member of the Transport Tribunal as from January 1, will cause widespread satisfaction, not only among railway officers, but among a far wider circle who have come to appreciate the outstanding work which he has performed since he joined the Great Western Railway in 1908. It mitigates the regret which Mr. Phillips's decision to retire from active railway work as from December 31 last occasioned. During the last forty-eight years, Mr. Phillips has developed qualities of mind which will serve him well in his new appointment, but which equally will be missed by his colleagues at Paddington and on British Railways generally.

Mr. Phillips has had a more than usually wide experience of railway administration, as will be seen from the biographical note given elsewhere in this issue. His studious habits of thought and his application, which have marked the whole of his career, ensured that he derived the full benefit from the various spheres of railway work with which he has been connected. Not the least of the attributes which he has brought to many responsible positions has been his flair for original thought and, without technical training, an appreciation and understanding of technical engineering and similar matters which can only have been derived from a deep and painstaking study. His unruffled and courteous manner have concealed, although they have not hindered, a steadfastness of purpose and a strength of conviction, which on occasion may have surprised those who have not known him well.

For the last three years, during which he has been Assistant General Manager at Paddington, Mr. Phillips has been intimately concerned with current policy developments, and in particular has played a leading part in the formation of policy relating to such matters as the diesel programme under the railway modernisation scheme, and has made a deep study of power costs as related to weight of rolling stock. There are many who will regret his departure from the active railway field at a time when important developments, in which he has played a full part, are impending.

Railway Expansion in Uganda

IN the face of strong opposition in the House of Commons in Westminster, the construction of a railway from Mombasa into the hinterland was approved and begun just 60 years ago. By 1901, railhead had reached Kisumu on the eastern shore of Lake Victoria, and also in the early years of the century two isolated lines were built in Uganda territory from ports on the north-western shore of that lake. They were the 5½-mile section from Port Bell to Kampala, the industrial capital of the colony, and the Busoga Railway from Jinja to Namasagali; in connection with the lake steamer services they provided communications between Uganda and the Indian Ocean via Kisumu and Nairobi, and were the first railways in Uganda.

Not until 1928 was the Uganda Extension of the Kenya railway system opened to Mbulamuti on the Busoga line to provide all-rail communication between Mombasa and Jinja. With the bridging of the Nile near Ripon Falls, Kampala was linked with Jinja and so with Mombasa in 1931.

Meanwhile, from 1907 onwards various surveys had been carried out from time to time with the object of opening up Western Province by rail and with the ultimate idea of a connection with the Congo territory. All the routes surveyed were common as far as Mityana, 45 miles west of Kampala, and they then struck slightly north of west in varying degrees to run either north or south of Fort Portal. By 1931, however, the importance of the mineral area in the Ruwenzori Mountains, some 200 miles due west of Kampala, was fully realised, and this influenced the objective of a further survey in that year. The advisability of a general opening up of the country still persisted to the extent of taking the alignment via Mubende, 100 miles along the main road, though this was not on the most direct route to the mining area.

By 1950 the Uganda Government had in its possession estimates prepared by the mining companies concerned, showing that the copper and cobalt deposits at the Kilembe mine, on the eastern slopes of the Ruwenzori Range, could produce 20,000-25,000 tons of copper and 1,500 tons of cobalt annually if a railway were built to transport these minerals. It therefore appointed a committee to investigate the potentialities of the area that would be served by such a railway. The committee reported in the following year that there was justification for a line via Mityana and thence direct to Kasese near Kilembe, with a further extension to the Congo border or one communicating with the marine services on Lake George and Lake Edward.

As a result, Government sanction was accorded in 1952 and final survey and construction started forthwith. It is interesting to note that the alignment throughout runs parallel to and at distances of only from 13-32 miles from the equator. The distance from Kampala to the terminus at Kasese is 208 miles. The first 150 miles traverse comparatively level bush, forest, and swamp lands and are followed by broken hilly terrain in the faulty area east of escarpment overlooking the Lake George basin and facing the Ruwenzori Range. The line leaves Kampala at an altitude of 3,770 ft. and, with small local humps at intervals, runs generally level and then slightly rising to the watershed between the Lake Victoria and Lake George basins near Kamwenge, 4,070 ft. It then drops 1,200 ft. abruptly to a swamp at the foot of the escarpment north of Lake George, and, with a final short rise, reaches Kasese at a level of 3,150 ft. Routes have also been surveyed to the Congo border and to Lakes George and Edward. The construction of this railway, one of the largest undertaken recently in the British Commonwealth and of great potential importance, is described on another page.

Developing the Lobito Route

THE traffic agreement signed in Bulawayo on November 8, 1956, between the Rhodesia Railways, Compagnie du Chemin de Fer du Bas Congo au Katanga, and the Benguela Railway Company, was duly ratified by the authorities concerned and has been in force from January 1. Under this agreement through rates now apply from the Portuguese West African port of Lobito on goods traffic to stations in Rhodesia, and also on copper from the Northern Rhodesian mines to Lobito, in accordance with the official statement issued after the Bulawayo meeting and reproduced in our issue of November 23.

The new arrangement enables Northern Rhodesia to take full advantage of its only rail link with the West Coast. Not only does the use of spare capacity on the Lobito route benefit the rapidly expanding economy of the Federation of Rhodesia & Nyasaland, but the distance by sea to and from Europe has been shortened by over 2,000 miles compared with shipment via East Coast ports, a factor of great importance in relation to the closure of the Suez Canal. From Lobito, traffic to Rhodesia travels over the Benguela line to the Belgian Congo frontier where it passes on to the Katanga Railway, which in turn connects with the railway system of Rhodesia; no transhipment is required. An important feature of the Benguela route is the port of Lobito, with its natural breakwater formed by a sandspit 3½ miles long enclosing a large deepwater harbour; the capacity of the port is being increased by the addition of two new berths, additional cargo handling equipment, grain silos, and mechanical ore-handling plant. By completion last April of the Kamina-Kabalo link in the Congo, Lobito is connected by a coast-to-coast railway route with Dar es Salaam, broken only by the crossing of Lake Tanganyika from Albertville to Kigoma and the change from the 3-ft. 6-in. gauge of the Benguela Railway and the lines in the Congo, to the metre gauge of the Tanganyika Central line of East African Railways & Harbours between Kigoma and Dar es Salaam.

Operated by a Portuguese company in which Tanganyika Concessions Limited has provided all the debenture capital and owns 90 per cent of the equity, the Benguela Railway is an outstanding example of Anglo-Portuguese collaboration. Much of the equipment has been obtained from Britain. Thus nearly one-half of the motive power consists of Beyer-Garratt engines, including 10 "10D" class oil-burning locomotives; a description of these engines, with some details of the traffic they are moving, is given on another page.

Diesel Fumes in Tunnels

SOME observations on diesel working through the Rimutaka Tunnel of the New Zealand Government Railways, sent us by Mr. A. T. Gandell, General Manager of the system, throw valuable light on the question of diesel fumes in tunnels, and should dispel many people's misgivings on this subject.

Before the opening of the Rimutaka Tunnel, he states, representations were received as to the possible effect on staff and passengers that would result from the use of diesel motive power. A thorough investigation was undertaken to determine the extent of air pollution from exhaust gases. From the expected traffic density and the characteristics of the motive power to be used it was established that the concentration of toxic gases in the tunnel atmosphere would be well below the permissible maxima for prolonged exposure. Shortly after working began through the tunnel, tests were made as a check against the original theoretical investigation and the results of these confirmed the calculations that concentrations were well below the maxima permissible.

The tunnel, opened for traffic on November 3, 1955, is a single track bore 5 miles 37 chains long. The east and west gradients rise at 1 in 180 and 1 in 400 respectively, to an apex at approximately the mid-point where a 9-ft. dia. ventilating shaft connects with the valley floor above. The tunnel volume of 6,451,000 cu. ft. consists of 3,001,000 cu. ft. west of the apex and 3,450,000 cu. ft. on the east leg. Natural ventilation is relied on. Air movement within the tunnel is complex as the effect of the ventilating shaft has been to divide the tunnel into two sections, each with different wind conditions. Periods of calm are infrequent and wind velocities of up to 17 m.p.h. have been recorded in the tunnel.

Typical week-day traffic consists of eight diesel-hauled goods trains and seven railcar services. The goods services are worked by 660-h.p. and 750-h.p. diesel-electric locomotives, two trains each day being hauled by two 750-h.p. units in multiple. The railcar services are operated by articulated twin-car units powered by two 210-h.p. Fiat diesel engines. The maximum interval between trains, i.e. exit and entrance of opposing trains, is about 4 hr., and the minimum interval is 3—4 min. No ventilation or pollution difficulties have been encountered during the time the tunnel has been in use, Mr. Gandell points out, and experience to date indicates that such problems are unlikely to arise in the future.

It would be interesting to know the results of similar tests, if such have been made, in an intensively worked double-track tunnel in a high temperature, still air, and a high degree of atmospheric humidity. Even so, the complete absence of trouble in the long New Zealand tunnel —after making allowances for the ventilating shaft and the peculiar atmospheric conditions—seems sufficient to allay all reasonable doubts as far as most tunnels are concerned in this country and elsewhere.

Canadian Passenger Traffic Problems

THE application of "supermarket" methods to railway passenger transport was advocated recently by Mr. Donald Gordon, Chairman & President of Canadian National Railways. Addressing the Canadian Club of Winnipeg on the subject "What is a Railroad?", he said that the passenger service must be made to "stand on its own feet." Competition, he declared, is bringing to an end the day when losses on passenger traffic can be recouped through gains on freight traffic. Research and analysis by the C.N.R., he said, is now directed towards catering for average tastes and average incomes in order to swell the volume of passenger traffic and reduce costs as an answer to severe competition from other forms of transport and the inflationary trend of prices. "We are trying to introduce into the passenger business the same modern, smart, but functional and low-cost service that the supermarket has been able to provide in the retail food business," Mr. Gordon explained, "not forgetting that there is still a place for personalised service. This objective fits in with the economic characteristics of a railroad." In doing this, the C.N.R. has no intention of degrading passenger service below North American standards of comfort and convenience.

In common with the opinion of many in this country, Mr. Gordon believes that no good purpose would be served by raising passenger fares at present. Speaking of the need to sweep away some of the traditional notions about passenger traffic—the kind of market being served, the pattern of pricing which should be adopted, and the kind of equipment which should be provided, he states that the C.N.R. is prepared to question all the assumptions on which services have hitherto been operated. There may be changes in sleeping and dining car facilities. The guiding principle is to be to give only what the public wants and is prepared to pay for. Competing forms of transport, he points out, have attracted travellers away from the railways without providing the costly sleeping facilities that have been traditional on railways. Accordingly, the C.N.R. is to examine the design of coaches and experiment with ways and means of meeting modern needs in terms of a travel habit that has already adapted to the limitations of travel by private motorcar, by bus, and by air liner.

In dining car service important progress has already been made by the C.N.R. through the development of

"dinettes," which encourage high-volume patronage through low-cost, simplified meals and counter service. But, Mr. Gordon adds, the C.N.R. is searching much further than this in efforts to make the service self-sustaining. He questions the justification for kitchens in dining cars, which he considers "terribly expensive" to operate and to make extravagant demands on limited space. Alternatives considered include precooked meals and automatic vending machines, but he admits that there is room for various kinds of meal service depending on the circumstances of particular passenger routes.

Long-term plans for improvement of C.N.R. properties in Western Canada include a six-year programme for main-line improvement from Armstrong, Ontario, to Vancouver and Jaspar to Prince Rupert, where the railway is to put down more than 9,000,000 tons of ballast, lay 400 miles of new and partly-used rails and nearly 1,000,000 sleepers, improve drainage and sub-structures and install modern signalling devices. Nevertheless, the C.N.R. is keeping a close watch on inflationary pressures in timing its improvements, bearing in mind the current cost of labour and material. As Mr. Gordon put it, "If only for selfish reasons—because the C.N.R. would be among the first to suffer from the effects of inflation—we have no intention of adding to the upward pressure on prices, and although our planning is going steadily forward, we are very conscious of the importance of timing in the execution of these plans."

Among other developments on the C.N.R., Mr. Gordon mentioned that centralised traffic control will soon be dealing with traffic in the Winnipeg area. In Winnipeg itself, the extensions to the station and approaches, started in 1955, are almost completed, and the lines in the terminal are being rearranged and extended. Plans are being drawn up for improvements at many other main stations and terminals. The hump retarder yard being built in Montreal will probably be the largest of its kind in North America, and there are plans, now "emerging from the blueprint stage" for Moncton, Toronto, and many smaller points. Operating facilities in Winnipeg are to be modernised, though Mr. Gordon was not able to be specific on the actual work to be undertaken.

Referring to the importance of distance when measurements of railway effort are being considered, he states that recent official statistics show that the average haul for a ton of goods carried by road in Canada is 60 miles. For each ton carried by the C.N.R. in 1955, the average distance was 407 miles. Combining the factors of volume, distance, and time into a single figure, expressed as gross ton-miles per freight-train hour, he points out that average production, on that basis, had risen by almost 28 per cent between 1946 and 1955, and a further improvement is expected when figures for 1956 become available.

October-November Traffic Trends

IN the four-week period No. 11, from October 8 to November 4, British Railways originated 22,265,000 tons of freight train traffic and worked 1,737,859,000 net ton-miles. The tonnage was 923,000, or four per cent, below the 1955 level and about 1,500,000 tons, or 6 per cent, less than in 1953, when originating traffic was larger than in any other year since nationalisation. Ton-miles decreased proportionately by 78,609,000 compared with 1955 and by about 123,000,000 compared with 1953. All Regions were affected by the recession in traffic movement, though in different degrees. For example, the London Midland Region tonnage was only 1·9 per cent lower, but the Region worked 6·1 per cent fewer ton-miles, while the Eastern, with a 3·7 per cent decrease in tonnage, worked 1·2 per cent fewer ton-miles.

The persistent decline in merchandise continued. A decrease of 183,000 tons, or 5 per cent, brought the loss of high-rated goods this year to 1,023,000 tons on November 4. Another disconcerting trend is a decrease in minerals which began in August. In the October-November period a drop of 213,000 tons (3·8 per cent) was in sharp contrast to an increase of 541,000 tons (10·8 per cent) in the four weeks to November 6, 1955. Coal and coke forwardings also declined by 530,000 tons, again 3·8 per cent, on top of a decrease of 408,000 tons, or 2·8 per cent, twelve months ago. This year's tonnage of 13,426,000 tons was 6·6 per cent below the quantity declared in the 11th period of 1953. It is disappointing that rail carriage of heavy traffics diminished while the output of steel and pig-iron rose in the months of October and November.

Passenger Traffic

On December 15, British Railways were reported to have originated 96,642,000 passenger journeys in the month of September, an increase of 1,219,000 on 1955, or 1·3 per cent. Additional journeys estimated to have been made by season ticket holders totalled 2,085,000, a rise of 6 per cent, which out-weighed a decrease of 866,000 in the number of ordinary and early morning tickets. The corresponding takings amounted to £11,386,000, an increase of £260,000, or 2·3 per cent. First class journeys numbered 1,813,000, an increase of 35,000 (2 per cent), and takings rose by £21,000 (1·9 per cent), the average fare being a fraction lower.

In the four weeks ended November 4, London Transport railways carried 45,601,000 people, 1,479,000 fewer than a year ago (3·1 per cent). Rail receipts of £1,791,000 were up 6·1 per cent, the average fare being a trifle over 9d. Road services carried 251,487,000 passengers, a decrease of 10,865,000 (4·1 per cent). Road receipts of £4,396,000 were 8·1 per cent higher, the average fare being nearly a halfpenny more. In 44 weeks to November 4 London Transport carried altogether 3,211,899,000 people, a decrease of 173,867,000, or 5·1 per cent; road services accounted for the loss of all but 4,189,000 passengers.

Road Passenger Transport, Provincial and Scottish, carried 511,000 fewer passengers during period 11. The Tilling Group lost 654,000 journeys, while the Scottish Group gained 143,000. The number of journeys was down in every four-week period since January. The total loss in 44 weeks amounted to 39,291,000 (1·9 per cent), but receipts rose by £1,925,000 (4·1 per cent).

Railways in 1857

FOREIGN affairs occupied an important place in the railway world of 1857, as indeed in the political and economic spheres, and, in the latter part of the year, a monetary crisis in both Great Britain and the U.S.A. had widespread effects. The Bank of England discount rate was altered nine times, and rose to 10 per cent. The year opened with Great Britain at war against China and Persia, and, although the Peace of Paris was signed between Great Britain and Persia on March 4, 1857, hostilities in China continued throughout the year, despite a bitterly divided Parliament. Unrest in India came to a head in May, with the outbreak of the Indian Mutiny, which delayed for some years the construction, already in progress, of the East Indian Railway. The projected Suez Canal, and its rival, the Euphrates Valley Railway, occupied continual attention in the transport Press, and *The Railway Times* ran a regular weekly feature headed "The Suez Chronicle." The Euphrates Valley Railway was promoted largely by former Indian Government officers and by the directors of the Scinde Railway Company. It proposed a railway from Seleucia on the Mediterranean to a point on the River Euphrates as offering the more desirable transport to the East, but, of course, the Suez Canal eventually prevailed. Argentina, for many years an outstanding sphere of British railway enterprise, opened its first railway on August 30. This was from Parque to Floresta, and was built to the 5-ft. 6-in. gauge that was adopted generally for the main railways of the country. Many apocryphal explanations have been given for the selection of this gauge, but the probable reason was the purchase of the locomotive *La Portena*, built in 1854 by Manning, Wardle of Leeds, and intended for

India. Some 2,000 miles of line were opened in the U.S.A. At home, the railway event of the year with the most lasting consequences was the first break in the Euston Square Confederacy. From the beginning of railways, the London & North Western had maintained its dominance as the "gateway to the North" by astute diplomacy, but the Great Northern demonstrated the illegality of some of the Euston dealings, and the "common purse" agreement between the L.N.W.R. and the Midland Railway came to an end on May 12, 1857. The Midland had opened a 65-mile goods link from Leicester to Hitchin (on the G.N.R.) on April 15, giving it access to London independent of the L.N.W.R. This, the longest individual section of new railway opened in the year, began to carry local passengers on May 8, and in the autumn the growing friendliness between the Midland and the G.N.R. resulted in an agreement for through traffic. The G.N.R. also made an alliance with the Manchester, Sheffield & Lincolnshire Railway (recently won over from the Euston Square camp) and a Kings Cross to Manchester London Road through service began on August 1.

These strategic achievements of the G.N.R. coincided with its heavy losses caused by the Redpath frauds. Leopold Redpath, Registrar of the G.N.R. company, was convicted at the Old Bailey on January 16 of large-scale duplicate stock issues, which cost the company £239,675. It is amazing that Redpath's eagerness for a whole-time position carrying a salary of £250 per annum, while he maintained a town mansion and a country house at Weybridge, did not sooner excite suspicion. This, and similar though smaller frauds of the same period, such as those of W. J. Robson on the Crystal Palace Company, shook faith in the non-professional auditing then general. Another trial of railway interest was that on January 13 of the railway employees Pierce, Burgess, and Tester for the great bullion robbery on the South Eastern Railway on May 15, 1855. They were traced and convicted on the evidence of a confederate named Agar, then undergoing penal servitude for another offence, who was incensed at their failure to meet a moral obligation of Agar's. It transpired that one of the receivers of the bullion was a famous forger, "Jem the Penman," who was found to be James Townsend Saward, a barrister. He was sentenced on March 5. An echo of the Sadlier frauds (which involved the Royal Swedish Railway) was the expulsion from the House of Commons on February 19 of James Sadlier, M.P., brother of the principal perpetrator, John Sadlier, M.P., who had committed suicide a year earlier.

Some 340 miles of new railway were added to the total of Great Britain during 1857, of which the principal dates of opening are given in our Scrap Heap columns. Important main-line sections include Yeovil to Weymouth (27¼ miles) and Andover to Salisbury (17½ miles). In addition, the first section of the East Kent Railway (later the London, Chatham & Dover) was opened formally from Chatham to Faversham on November 11, but public traffic did not begin until 1858. A census of railway staff at June 30 showed for the first time a total exceeding 100,000; there were 102,265 persons employed on the railways of Great Britain on 7,882 miles of line open, compared with 96,011 persons on 7,519 miles at June 30, 1856. A collision on June 28 at Lewisham, on the South Eastern Railway, caused the death of 12 passengers, the greatest number in a British train accident up to that time. The explosion of the fog signal factory of the Eastern Counties Railway, near Stratford Junction, on February 26, resulted in three deaths.

On March 12 the railway suspension bridge crossing the Des Jardins Canal between Toronto and Hamilton gave way under a derailed train. The carriages were thrown into the abyss, and only 20 of the 97 persons survived. Early in 1857 the first steel rail, made by Robert Forester Mushet, was laid experimentally at Derby Station, Midland Railway, on a line carrying heavy traffic. It remained in service until June, 1873. Steel rails came into general use a few years later; the first on the L.N.W.R. were laid at Chalk Farm in 1862. On June 24 Queen Victoria formally opened the South Kensington Museum, an event which is being celebrated this year as the centenary of the Science Museum. A young American named Zerah Colburn, who came to England in 1857 to study our railways, became Editor of *The Engineer*, and in January, 1866, founded *Engineering*.

Letters to the Editor

(*The Editor is not responsible for opinions of correspondents*)

Road v. Rail

December 22, 1956

SIR,—Referring to Mr. Duncan Bailey's letter in your December 21 issue in which he asks what £ s. d. value should be placed on lives lost and the injuries which are daily inflicted on the roads, may I say that one of the results expected from nationalisation was the freeing of the roads from heavy consignments and the return of the latter to the railway where they rightfully belong, with consequent increase of safety on the roads.

The first Chairman of the British Transport Commission, Lord Hurcomb, was appointed by the Government of the day, at a not inconsiderable salary, to co-ordinate road and rail transport; but he failed to do this. On the contrary, as a result of favouring road transport, more vehicles were thrown on to the roads, with added danger to life and limb. There does not appear to be any change in this policy.

Those who believe that expanded rail transport is beneficial to the economy of the country should elect representatives to Parliament to seek new leadership in transport, competitive, lower rates on the railways to reduce road haulage to its proper proportions, and greater safety on the roads.

Yours faithfully,

ROBERT W. LEWIS

Beth-El, 104, Leggatts Way, Watford

Increased Productivity

December 23, 1956

SIR,—Those of your readers who have read Mr. Bell's attacks on British Railways in his letters published in your issues of November 23 and December 21 should now read the relevant section of the British Transport Commission memorandum. It will be obvious to them that the Commission was not attacking the American railroads, as stated by Mr. J. H. Brebner in his letter in your December 7 issue. There the matter should have rested.

Mr. Bell has taken one sentence out of context; for the particular section of the memorandum was concerned with increased labour productivity in the restricted sense of improvement to be expected apart from the use of new equipment. The increases are the years 1948 to (presumably) 1954 quoted, covered railway systems affected in differing degrees by the introduction of new equipment, and the inference to be drawn was that less was to be expected when the effect of the introduction of new equipment was discounted. Even if the average annual percentage increase derived from Mr. Bell's calculation is substituted in the case of U.S.A., the validity of the Commission's argument is undisturbed.

The conventional operating derivatives for the American railroads to which Mr. Bell refers are hardly relevant to labour productivity in the above sense, particularly as Mr. Bell states that their improvement is due almost solely to a virtually complete re-equipment of the American railroads in the 10 years since the war.

British Railways have now begun the long overdue modernisation of their system which they were prevented by Government controls from undertaking in the immediate postwar period. Their plans require constructive criticism, not sniping of this nature.

Yours faithfully,

G. D. WATERS

65, Church Hill, Loughton, Essex

THE SCRAP HEAP

Some British Railways Centenaries of 1957

Below is a list of some British railway centenaries which occur during 1957:—

January 1, Lewisham to Beckenham opened (4¼ miles), Mid-Kent Railway

January 20, Yeovil to Weymouth opened (27½ miles), Great Western Railway

January 26, Duffryn Junction to Llandilo opened (7 miles), Llanelly Railway & Dock Company

February 2, Hendford to Yeovil, Pen Mill opened (1½ miles), Bristol & Exeter Railway

February 2, Bradford to Bathampton opened (9¼ miles), Great Western Railway

February 2, Summer Lane to Barnsley, Regent Street (1 mile), opened for goods; passengers August 1, Manchester, Sheffield & Lincolnshire Railway

March 2, Picton to Stokesley opened (8¼ miles), North Yorkshire & Cleveland Railway

April 2, Leamside to Bishop Auckland opened (15 miles), North Eastern Railway

April 15, Leicester to Hitchin (65 miles), opened for goods; passengers May 8, Midland Railway

May 1, Andover to Salisbury Milford opened (17¼ miles), London & South Western Railway

May 25, Crumlin Junction to Tredegar Junction, afterwards Pontllanfraith (3¼ miles) opened for goods; passengers June 1, Newport, Abergavenny & Hereford Railway. This included the Crumlin Viaduct.

June 1, Twyford to Henley opened (4½ miles), Great Western Railway

June 6, Ladybank to Strathmiglo opened (6½ miles), Fife & Kinross Railway

June 9, Stockport to Whaley Bridge opened (10¼ miles), Stockport, Disley, & Whaley Bridge Railway

June 16, Barkstone to Sleaford (11 miles), opened for passengers; goods September 1, Boston, Sleaford & Midland Counties Railway

June 23, Sandy to Potton opened (3¼ miles), Sandy & Potton Railway

July 1, Holt to Devizes opened (8¼ miles), Great Western Railway

August 2, Leominster to Kington opened (13¼ miles), Leominster & Kington Railway. Previously used by contractor for coal traffic

August 10, Carnforth to Ulverstone (19 miles), opened for goods; passengers August 27, Ulverstone & Lancaster Railway

August 11, Leven to Kilconquhar opened (6½ miles), East of Fife Railway

September 5, Inveramsay to Turriff opened (17¾ miles), Banff, Macduff & Turriff Junction Railway

October 1, Crystal Palace to Norwood Junction opened (1¼ miles), West End of London & Crystal Palace Railway

October 1, Bedlington to Morpeth (5 miles) opened for goods; passengers April 1, 1858, Blyth & Tyne Railway

October 3, Colwick to Nottingham opened (2¾ miles), Ambergate, Nottingham & Boston & Eastern Junction Railway

October 5, Holbeck to Wakefield opened (9¼ miles), Bradford, Wakefield & Leeds Railway

October 10, Gildersome to Ardsley opened (4¼ miles), Leeds, Bradford & Halifax Railway

October 12, Usk to Monmouth Troy opened (12 miles), Coleford, Monmouth, Usk & Pontypool Railway

November 12, Maiden Newton to Bridport opened (9¼ miles), Bridport Railway

December 1, Wells to Fakenham opened (9½ miles), Wells & Fakenham Railway

December 22, Nairn to Dalvey, near Forres, opened (8 miles), Inverness & Aberdeen Junction Railway

December 28, Rhymney to Hengoed Junction (9¼ miles) opened for minerals, Rhymney Railway.

Juvenile Toys

To many children the motor car is commonplace, the train an exquisite and romantic treat. . . . There is the corridor, a wonderful safety valve for those having a difficulty in sitting still. If it does not get too full, as it did in wartime, it makes the perfect track for hurdle races over other people's bags. Any fair-minded child will admit that a picnic under a gorse bush by the roadside has its points, but it is nothing to the sophisticated beauties of a restaurant car. The parent who insists on sandwiches in the carriage must have a heart as hard as the hard-boiled egg which accompanies them. . . . Even the least romantic of grown-ups has some feeling for a junction if it comes near the end of the journey and so to the arrival at some familiar paradise. The "infinite melancholy piping" of porters crying the names of the few intervening stations can sound like home-coming bells even in his dull ears. —*From "The Times."*

Greetings by the Wayside

Good wishes for Christmas and the New Year were expressed by the department of the Chief Commercial Advertising Officer, British Transport Commission, on models of hoardings as erected on British Transport roadside sites

Risky Whisky

(*Whisky trains in Scotland have been travelling under armed escort*)

It seems that British Railways have
Been forced to find some escorts
To guard the festive convoys of
Our precious dollar exports;
For there's a rumour floating round
Of pirates on the Main
And Jolly Rogers being flown
At mastheads once again.
These pirates, notwithstanding that
Their plans seem rather risky,
Forsaking their traditional rum,
Are gunning now for whisky.
We thought that in the vasty deep
Spirits were bred and born,
But that, it seems, does not apply
To old John Barleycorn.
"Who steals my purse steals trash"; so wrote
The one and only Bard;
But those who tackle whisky trains
Will find the going hard.
Good men and true will make them rue
And take them down a notch,
Defeat their dark designs and make
Them hop without the Scotch!

A. B.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

New Motive Power and Rolling Stock

With more of the Class 5E electric locomotives and the Class GMA/M steam locomotives in service, there has been a welcome increase in recent months in the motive power.

During the three months July-September, 1956, eight Class 5E electric locomotives, 15 first class main-line passenger coaches and 435 goods vehicles of various types were added to the establishment. The new goods stock included 126 cattle and 144 refrigerator wagons and 12 petrol tankers. Nineteen locomotives, seven passenger coaches, and 398 old goods vehicles were withdrawn from service and scrapped during the period.

Wagons for Liquefied Petroleum Gas

Four additional special tank wagons for the conveyance under pressure of liquefied petroleum gas from Merebank to Durban, Wadeville, Natalspruit, Pretoria, Talana and Cape Town, are being built in the Germiston workshops at a total cost of £16,000. When these new tank wagons become available early next year the railways will have eight of this special type in service.

The barrels are of boiler quality plates 1 in. thick and the dished ends are $1\frac{5}{16}$ in. thick. They were made by the Vanderbijl Engineering Corporation Ltd. (Vecor) and are of fusion welded construction. The underframes of the first four were made in the Pietermaritzburg workshops and those of the second four are being fabricated at Germiston. All the domes, valves, and valve fittings were imported from the U.S.A. The wagons each have a capacity of 1,090 cu. ft., a permissible weight of 34,330 lb. and capacity of 6,350 gallons. Their working pressure is 240 lb. per sq. in.

CANADA

Buffalo & Lake Huron Railway

The directors of the Buffalo & Lake Huron Railway Company have announced that the offer of Canadian National Railway Company to purchase the whole of the ordinary shares of the company has been accepted by the holders of over 90 per cent of such shares and has become unconditional.

Welfare Plan for Railwaymen

Details of a health and welfare plan affecting about 140,000 non-operating railway employees and their families, estimated at 500,000 in all, have been approved in principle by representatives of the Canadian National, Canadian Pacific, Ontario Northland, Algoma Central, and Toronto Hamilton & Buffalo Railways.

The plan gives effect to provisions of the Master Agreement signed by the railways and 15 non-operating unions on May 16, 1956, and will cost about $13,500,000 annually, shared equally by the railways and contributing employees. Since signing the Master Agreement, a joint union-management committee has worked continuously to produce a satisfactory scheme.

As provided in the Master Agreement, $4·25 per month will be deducted from the employees' pay. The railways will contribute $4·25 per month, per employee.

Group life insurance is provided for in the amount of $500 and weekly compensation for loss of income through sickness or non-occupational accident to a maximum of $40 a week for employees only. These benefits, applicable throughout Canada are to be underwritten by the Sun Life Assurance Company in association with the Great-West Life, Canada Life, London Life, Mutual Life, and Confederation Life.

Hospital and surgical benefits are made available to employees and their dependants and are underwritten by Blue Cross and Trans-Canada Medical plans as a result of competitive bidding. In Saskatchewan, Alberta, and British Columbia, where statutory Provincial hospital plans operate, employees and their dependants will be provided with comprehensive medical and surgical benefits. Canadian Pacific employees in British Columbia will continue to have surgical and comprehensive medical benefits provided by the Canadian Pacific Employees Medical Association of British Columbia, and premiums covering these benefits will be paid to the Association.

Diesel Units for Newfoundland

Twenty-six Canadian National Railways 3-ft. 6-in. gauge diesel locomotives have been shipped to Newfoundland. The locomotives are 1,200-h.p. road shunters, and complete the conversion to diesel traction of the 700 miles of railway in Newfoundland, making it the second province of Canada to be completely converted by the C.N.R. Prince Edward Island was the first.

New C.N.R. Hotel in Montreal

The Queen Elizabeth Hotel of the Canadian National Railways under construction in Montreal. It will have 21 storeys and is scheduled to be completed early in 1958

UNITED STATES

Stations in Chicago

The intention of the New York Central System to concentrate most of its passenger services into and out of Chicago at the La Salle Street Station is meeting with opposition from the Illinois Central Railroad. If the N.Y.C. plan is carried through, the Michigan Central trains between Detroit and Chicago will move from the Central Station to La Salle Street, and only the few "Big Four" trains to and from Indianapolis and Cincinnati will remain at Central, which hitherto has been used jointly by the N.Y.C and I.C. Companies.

The I.C. has filed a suit to restrain the N.Y.C. from making this change, on the ground that loss of the Michigan Central's share in the cost of operating the Central Station and M.C. rental for the use of I.C. tracks between Central and Kensington would cost the I.C. $500,000 a year, disrupt present trains connections, and leave the I.C. with a bigger terminal than it needs for its own service. It would also terminate a joint operation which has continued for 104 years. The N.Y.C., on the other hand, contends that considerable economies can be effected by the transfer.

Collision on General Roca Railway

A collision took place on November 17 between two suburban passenger trains of the General Roca Railway. The locomotive of a La Plata to Constitución train jumped the rails between Avellaneda and Gerli and collided with a Constitución to San Vicente train travelling in the opposite direction. Several coaches were derailed and severe damage was done to the track and signalling installations. Casualties were one killed (the driver of the first train) and six injured; these low figures were due to the fact that at the time of the accident, 1 a.m., there were relatively few passengers travelling.

PORTUGAL

Bridge Reconstruction

Use of diesel locomotives and heavier rolling stock on the Beira Alta line, between the Spanish frontier at Vilar Formoso and Pamphilosa, has necessitated rebuilding underline bridges on this section. Work began last year, and progress is stated to be satisfactory. Steelwork is being supplied by Krupp.

FRANCE

Station Garages

The S.N.C.F. is now providing garage facilities for motorists proceeding by rail at 53 stations, including one Paris terminal, Montparnasse. Some garage accommodation is under cover, but in other cases open-air car parks are provided. The service is normally available night and day, the charge generally being at the rate of 100 francs per 24-hr. period. At Paris Montparnasse and certain other stations the rate is 120 francs, whilst at Rheims, where a special supervisor is necessary, the 24-hr. rate is 150 francs.

The policy is to provide garaging facilities at stations where such facilities are not otherwise available or convenient in the neighbourhood of the stations.

BELGIUM

Baggage Lockers

Baggage lockers, with locks actuated by 5-franc pieces, have been installed in some principal passenger stations. They resemble in essentials those installed in some stations of British Railways.

Publications Received

Les Transmissions de Puissance et la Variation de Vitesse (*Power Transmission Systems and Speed Control*). By P. Patin. Paris, 5e, 1956: Editions Eyrolles, 61, Boulevard St. Germain. 9¼ in. × 6¼ in. 338 pp., 326 fig. and 8 plates. Price fr. 3,300.—The advent of the internal combustion engine in railway traction brought the need for a means of conversion between its relatively limited speed range and the track speeds required of the locomotive in service with varying loads. In this book Monsieur Patin, a senior engineer of the French National Railways, reviews the whole range of technical problems presented to industry and transport by this characteristic of internal combustion engines and of many electric motors. He goes on to discuss the component parts of transmission systems—mechanical, hydraulic and electric—and then describes a representative variety of examples for industrial and transport use. Two concluding chapters on d.c. and a.c. transmission illustrate arrangements for diesel-electric locomotives and for electric converter locomotives with rotary groups or rectifiers. Several arrangements for flexible drives and resilient gears are described in the section dealing with components common to transmission systems in general, such as clutches, universal joints, gears, and bearings. The author has taken an unusually broad view of his subject, so that the reader will find notes on electronic amplification under the heading of servo-mechanisms, and also, with reference to grid-control of rectifiers, under d.c. transmission systems. In so extensive a survey, descriptions of individual mechanisms and systems are necessarily brief, but a valuable purpose has been served by bringing together so much information and its theoretical background. Railway engineers concerned both with traction and with machinery drives in workshops will find the book a comprehensive guide to the study of the transmission problems which they encounter.

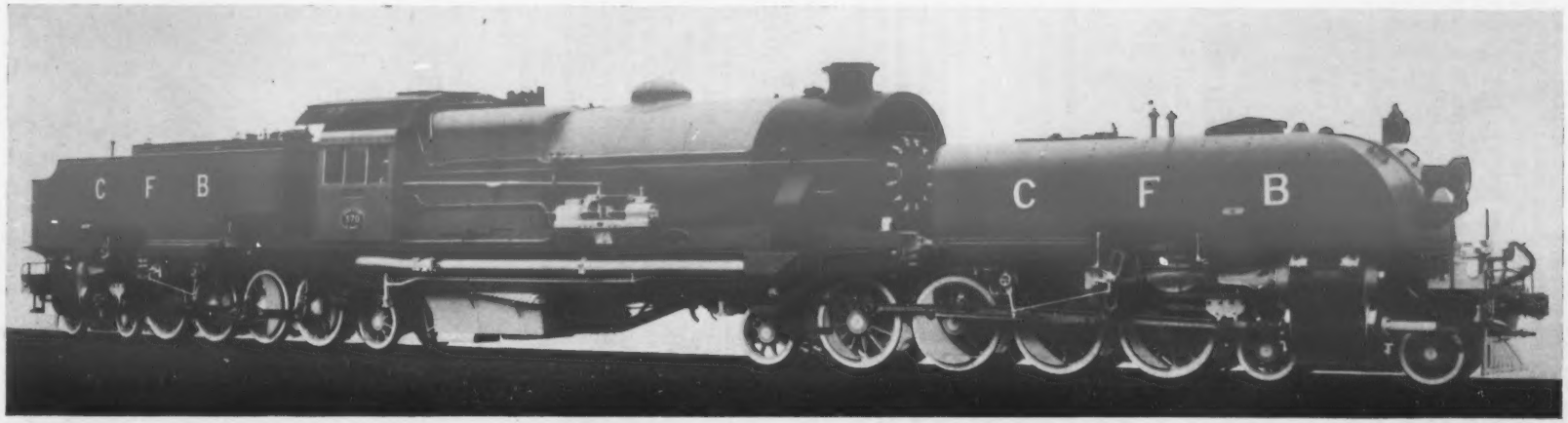
Dorman Long Illustrated 1956.—A booklet issued by Dorman Long & Co. Ltd., Middlesbrough, tells the story, in word and picture, of some of the achievements over the past year of the various companies in the Dorman Long organisation, in different parts of the world. Included in the survey is a description of the organisation behind the formal press announcement of the placing of a typical order for a bridge. A brief survey is given of some of the operations involved, from the studying of a tender to the completion of the bridge.

SJ—Nytt (*Swedish State Railways News*): No. 11-12, 1956. 47 pages. 11¼ in. × 8 in. Fully illustrated. Obtainable from the Swedish Travel Bureau, 7-8, Conduit Street, London, W.1.—This enlarged number has been issued in connection with the centenary of the opening in December, 1856, of the first sections of State-owned railway in Sweden and contains a variety of informative articles beginning with one by the General Manager, Mr. Erik Upmark, on the growth of the national railway system, the part played by it in Sweden's economy and what it has to offer in aiding its future prosperous development. Local conditions made construction of railways no easy task, and one article by a writer who took part in the work recalls the hardships faced and difficulties overcome. A chronological record, it enumerates the principal railway events of the 100 years and of those leading up to them, which date from 1829. Technical aspects of railway questions are dealt with in a series of short articles. There is also an "illustrated interview" with Mr. Upmark. Other items are concerned with the entry of women into the railway service, certain aspects of railway planning in early years and the events taking place at the opening of the lines in 1856.

Powdered Metal Processes.—How high-strength parts can be manufactured by the use of new powdered metal processes is shown in a brochure issued by Machine Products Limited. Parts can be produced to a high degree of accuracy and to intricate shapes, virtually eliminating the need for subsequent machining operation and thus freeing machine tools for other urgent work. One of the great advantages of the process is that high strength components can be manufactured with most of the characteristics of a casting or forging. The brochure is obtainable from the firm at 58, Vicarage Lane, Ilford.

Nickel Plating for Engineers.—This publication has been written primarily for engineers, designers and others who are interested in the possibilities which plating offers in design. No attempt has been made to cover plating procedures in great detail, but practices have been dealt with in so far as they affect the properties of the resultant deposits. The text includes a description of surface preparation in general and for zinc-base alloys, aluminium and nickel-chromium-iron alloys in particular. Commonly used solutions, relevant plating procedures to maintain high quality work, plant required, mechanical properties of deposits and methods of testing deposits are all dealt with in a highly compressed text. A good deal of information is given in the form of graphs or tables for quick reference. Copies of the publication are obtainable free of charge from the Mond Nickel Co. Ltd., Publicity Department, Thames House. Millbank, London, S.W.1.

Beyer-Garratt Locomotive for Benguela Railway



Benguela Railway 4–8–2 + 2–8–4 *locomotive equipped for burning oil fuel*

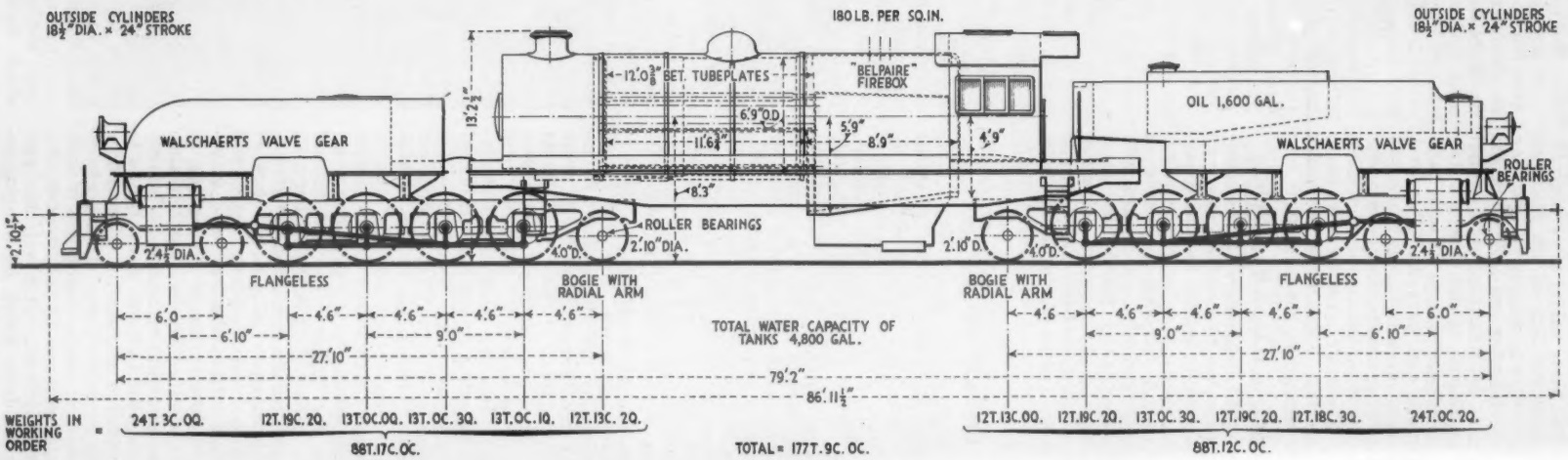


Diagram showing principal weights and dimensions of the Beyer-Garratt "10D" class locomotive

Beyer-Garratt Locomotives for Benguela Railway

First engines equipped for oil burning supplied to this administration

AMONG the Beyer-Garratt locomotives recently completed by Beyer, Peacock & Co. Ltd. are 10 for the 3-ft. 6-in. gauge Benguela Railway. This latest delivery brings the number of Beyer-Garratt locomotives on that railway up to 48; the first Beyer-Garratts were placed in service in 1926. The locomotives were designed to operate on heavy gradients of 1 in 40, and in 1 in 50 over the Lobito-Novo Lisboa section of the line. These engines, which were described and illustrated in the April 1, 1927, issue of *The Railway Gazette*, weigh just over 158 tons in working order, and were probably at that time the heaviest locomotives yet built for the 3-ft. 6-in. gauge. After the success in operation of these engines, the Benguela administration ordered a further 14 Beyer-Garratt engines in 1929.

Increased Traffic

There has been a steady increase in both freight and passenger traffic on the railway since the war. Export international freight traffic consisting of various minerals, such as ores from the Belgian Congo, amounted to some 375,000 tons in 1954, import through traffic amounted to some 230,000 and local traffic was 523,000 tons. These figures continue to rise, and for the first six months of 1955, compared with the equivalent period of the previous year, show increases of 7, 22, and 17 per cent respectively. In the 10 years 1943-53, train miles rose from 923,770 miles to 2·93 millions.

To meet this continued increase in traffic, the administration purchased a further 18 Beyer-Garratt engines in 1952. Classified "10C," the engines have a tractive effort of 52,360 lb. at 85 per cent boiler pressure; they were described and illustrated in our issue of May 30, 1952. For the most part, locomotives consume wood fuel, and the management has built up an extensive organisation through which supplies are arranged, partly from contractors, and partly from the railway's own forestry service. Some indication of the work involved is the fact that, in 1954, some 427,000 tons of wood was consumed. The forestry service employs some 3,000 men who plant by mechanical means, up to 16 million trees annually, cut wood into billets, and stock it near the lineside; the total area cultivated is about 80,000 acres.

Fuel Oil Experiments

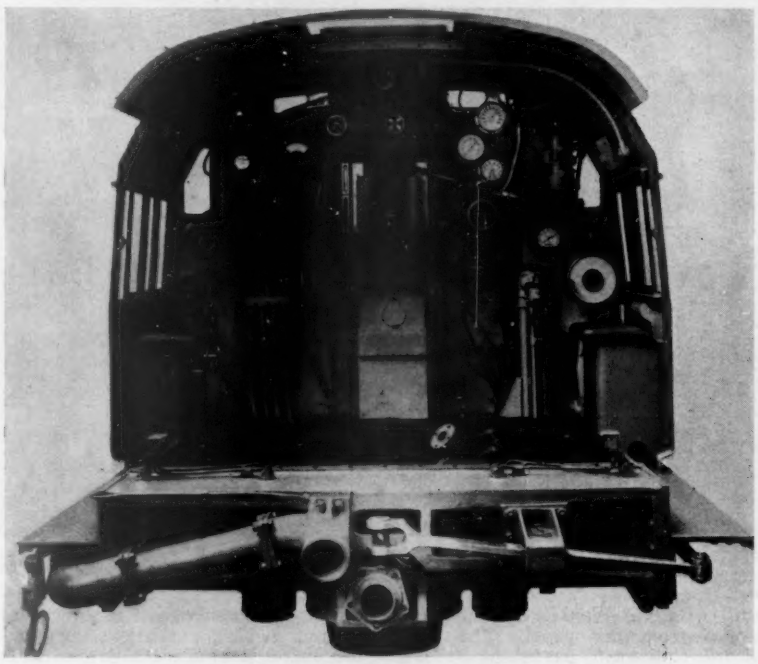
Coal, or a mixture of coal and wood, is used for the first 125 miles from Lobito, where wood is more costly and difficult to obtain; it is also the section with the heaviest gradients. In view of the amount of work involved in supplying wood fuel, it is intended to carry out experiments with oil burning, and the latest Beyer-Garratt engines have been so equipped, and will be the first oil-burning locomotives to work on the Benguela Railway.

These locomotives, which are classified "10D," to distinguish them from the wood-burning engines, are very similar to the "10C" class engines supplied in 1952, and have the same basic dimensions, and tractive effort. They have a maximum axleload of 13 tons, and are capable of hauling loads of 470 tons on grades of 1 in 40 with uncompensated reverse curves of 330-ft. radius at a minimum speed of 10 m.p.h.; the total weight in working order is 177·5 tons. If the experiments are successful, all the locomotives employed on the Lobito-Cubal section will be converted to oil-burning.

Steel Firebox

The boiler of the "10D" class engines has been fitted with a steel firebox with steel water space stays, no archtubes have been fitted, but provision has been made for their subsequent fitting should it be desired. The firebox is of the Belpaire type similar to the "10C" class engines, but because of the removal of the archtubes there is a slight difference in the heating surface amounting to 22 sq. ft., but there is an increase in grate area. The firehole door has been designed for burning oil fuel, and a flame pan is fitted in place of the ashpan on the other locomotives.

The engine units of the "10D" class, such as cylinders, piston valves, valve gear, and so on, are similar to the previous locomotives, Hendrie type bye-pass valves are fitted to the steam chests, and piston and valve rods are provided with United Kingdom metallic packing. Hadfield patent, power reversing gear is fitted on the right-hand side of the boiler unit frame. Bar frames are used, and the pivot centres, cast integrally with the frame-stretchers, are of the Beyer, Peacock patent self-adjusting type, fed by mechanical lubrication. Spring-loaded friction side bearers are fitted.



View of cab, showing the layout of equipment

Coupled wheel axleboxes, which are of solid bronze in the "10C" locomotives, are in the present design of cast steel with bronze inserts; Ajax grease lubricating keeps are fitted. Three Davies & Metcalfe automatic, flange lubricators type C.P. are fitted, two on the inner headstock of the front unit, and one on the engine frame of the hind unit, both lubricating the wheel flanges of the inner bogie. They are entirely automatic in operation and delivery of oil to the flanges is in proportion to the side movement.

Skefko roller-bearing axleboxes are fitted to both the outer and inner bogies. Ball and expansion joints are in accordance with the maker's latest practice, and all pipes are arranged to provide maximum accessibility. The

(*Continued on page* 12)

Diagram showing principal weights and dimensions of the Beyer-Garratt "10D" class locomotive

Centralised Traffic Control in Rhodesia

Power operation of points on latest section of Livingstone line system

WITH the recent extension of C.T.C. over the 16 miles from Dett to Inyantue (recorded in our November 2 issue), 70 miles of the installation being provided by the Siemens & General Electric Railway Signal Co. Ltd. for the Livingstone main line of the Rhodesia Railways are now in operation. This company's equipment will extend eventually from Wankie to Gwaai, a distance of 123 miles, controlled from a panel at Dett. Two independent systems—Gwaai to Dett and Dett to Wankie—are both controlled from this panel. The supervisory equipment has common relay sets, capable of immediate changeover in case of a fault by operation of a control panel switch.

Part of the S.G.E. control panel at Dett for centralised traffic control on the Gwaai—Wankie section

Remote Power Operation of Points

In the original S.G.E. installation in Rhodesia, between Heany Junction and Gwelo on the Salisbury main line, the first of its kind on the African continent, points were operated manually under releases from the control panel, but remote power operation is being adopted on the Dett-Wankie section of the new work and is already in use between Dett and Inyantue. There will be 16 type HA machines with type HL dual point controllers giving local power or hand operation on this section. The complete installation will control 18 crossing loops, with provision for four more to be added later, and will include 72 three-aspect, 72 two-aspect, and 72 shunt signals.

In the S.G.E. system all commands and indications are transmitted in the form of selective coded d.c. impulses over one pair of line wires. A special feature is the setting of the directional block section control automatically by operating the block entrance signal key.

The key switches on the control panel are mounted in vertical groups below the portions of the track diagram to which they refer. Operation is effected by the controller first setting the keys of a group to the required position and then pressing a "start" button which causes the code impulses to be transmitted. The condition of all track circuits, points and signals is shown continously by lamp indications, changes in the display taking place automatically, but the controller can always make a check by pressing a "check" key on the panel under each group of key switches, causing the field unit to send in a complete set of the indications which are normally transmitted automatically on a change in state of any indicated function. Standard British Post Office type 3000 relays are used throughout in the control machine and are mounted on jack-in plates with dust covers.

All field station units are alike and interchangeable, the identifying code for each being determined by straps on a terminal platform which remains in place and undisturbed when the unit attached to it is removed for inspection or overhaul. Thus all field units take up the appropriate station identification code when the platform is attached for operation.

Beyer-Garratt Locomotives for Benguela Railway

(*Concluded from page* 11)

expansion joint accommodates a stainless-steel ground sleeve welded to the end of the pipe working in Wallico moulded packing.

A vacuum ejector is fitted for controlling the train brakes with steam brake on the engine units. A simple form of counter pressure braking has to be provided for this railway and it is similar to the Chatelier arrangement. Stone's electric lighting is fitted with Tonum headlights at the outer ends of the engine units.

The locomotives, painted black and numbered 361 to 370 inclusive, have been built to the requirements of the Benguela Railway under the supervision and inspection of their Consulting Engineers, Messrs. Freeman Fox & Partners. Principal dimensions are as follow:—

Cylinders (4), dia. × stroke	18½ in. × 24 in.
Coupled wheels, dia.	4 ft.
Wheelbase, rigid	9 ft.
Axleload	13 tons
Adhesive weight	104 tons
Total weight in working order	177½ tons
Boiler pressure	180 lb./sq. in.
Heating surface:—	
Tubes	2,231 sq. ft.
Firebox	207 sq. ft.
Total evaporative	2,438 sq. ft.
Superheater	419 sq. ft.
Total	2,857 sq. ft.
Grate area	51·6 sq. ft
Tractive effect at 85 per cent boiler pressure	52,360 lb.
Oil capacity	1,600 gal.
Water capacity	4,800 gal.
Gauge	3 ft. 6 in.

Electrification from Shenfield to Southend Victoria

Extension of Liverpool Street to Shenfield electrification; special stock for fast services

Train of two four-car sets at Shenfield station, Eastern Region

THE Eastern Region, British Railways, Liverpool Street-Southend Victoria electrified service was inaugurated on Monday last, as recorded on page 26. The work of electrifying the section between Shenfield and Southend-on-Sea Victoria began in the summer of 1955, and is an extension to the existing Shenfield electrified line completed for passenger service in September, 1949, on the 1,500-V. d.c. overhead system. The extension is a double-track branch line diverging from the main Colchester line at Shenfield and terminating at Southend-on-Sea Victoria. It is about 21 route-miles long, and comprises approximately 49 single track-miles.

Power Supply

There are three substations on the Shenfield - Southend - on - Sea Victoria line. These are at Ramsden Bellhouse, Rayleigh, and Prittlewell. Electrical energy at 33-kV., 3-phase, 50-cycles, is brought directly by a single feeder owned by the Eastern Electricity Board to Ramsden Bellhouse substation, situated approximately 7 miles from Shenfield.

A similar arrangement also applies to Rayleigh substation, situated approximately 14 miles from Shenfield, except that in this case there is a run of approximately ¼ mile of E.H.T. feeder cable which is part of the railway distribution system between the point of supply and the substation. In the case of Prittlewell substation, which is approximately 20 miles from Shenfield, the Eastern Electricity Board again supply the substation directly but with duplicate feeders at 33 kV., 3 phase, 50 cycles.

Ramsden Bellhouse is a single unit substation having one 2,000-kW. mercury arc rectifier. The equipment comprises one 500-MVa., single bus-bar metal-clad switchboard having one 400-amp. rectifier breaker and duplicate 30-kVa. plug-in type auxiliary transformers. The 1,500-V. d.c. switchboard comprises one 2,000-amp. high-speed circuit breaker and four 1,600-amp. d.c. high-speed circuit breakers.

Rayleigh substation is identical with Ramsden Bellhouse except that the E.H.T. switchgear is rated at 750 MVa., and there is only one plug-in type auxiliary transformer. At Prittlewell substation, again the only difference from Ramsden Bellhouse is that the E.H.T. switchgear is rated at 750 MVa., but in this case it is a double unit substation. Three track sectioning cabins, each with four supervisory controlled high-speed circuit breakers are located at Billericay, Fanton, and St. Mary's, each being approximately mid-way between the existing Shenfield substation and the three new substations mentioned above.

Each of the substations and the track sectioning cabins are supervisory controlled from the existing electric control centre of the Liverpool Street-Shenfield line at Chadwell Heath. A pilot cable for the remote control of the substations and track-sectioning cabins is carried in concrete troughing along the cess in conjunction with the Signal Engineer's cables.

Overhead Equipment

Overhead line equipment is similar to that provided on the Liverpool Street-Shenfield line but the total copper equivalent is 0·6 sq. in. per track instead of 0·75 sq. in. The main and auxiliary catenaries are of hand-drawn copper and the contact wire is of cadmium copper alloy. Span wire registration has been adopted instead of mechanically independent registration. The insulators used are of the cap and pin type. Overlap spans are provided at convenient points along the line which is thus sectioned electrically not only at the substations and track sectioning cabins but also by hand operated switches at certain strategically placed overlap spans.

The d.c. feeder cables from the substation and track sectioning cabins are laid in concrete troughing at surface level to their respective switches mounted on the structures. Both rolled-steel joist and B.F.B. sections have been used for the structures supporting the overhead line equipment, the majority being galvanised. The steel structures on which the line equipment is anchored are of fabricated type. Seven pre-stressed concrete structures have been erected experimentally between Rochford and Prittlewell. The supporting structures are spaced up to a maximum of 240 ft. apart.

Between Rochford and Prittlewell stations the line passes in close proximity to the Southend Municipal Airport and the overhead equipment has been kept as low as practicable by locating the supporting structures much closer together than usual. The structures in the immediate vicinity of the runways have been painted with distinctive colouring for the additional safety of aircraft and the Airport authorities have installed aircraft warning lights.

Overhead Line Construction

The construction unit used for the erection of the overhead line equipment consists of three separate parts—the first contains the earth-boring unit for hole boring, after which temporary ground frames are placed over the excavated holes. This is followed by the steelwork erection unit drawn by a self-propelled steam crane which lifts the masts into the excavations where they are held in the steel ground frames at their correct position and height. The third part is the concreting unit which fills the excavations.

The earth-boring unit consists of a boring head driven by a diesel engine, mounted on a railway wagon. The unit can be made to travel along its own truck, to rotate about its axis, to traverse in an across-track direction, to be raised or lowered, and to be adjusted to the vertical for any cant of track. In this way the unit can be quickly and accurately positioned. Holes measuring from 2 ft. to 3 ft. 6 in. in dia. can be bored and the maximum depth of bore is 12 ft. The holes can be bored up to a distance of 13 ft. 6 in. from the centre line of the track.

The concreting unit, also mounted on a railway wagon, is made up of two electrically-driven mixers, each embody-

ing a batch weigher. Between the mixers is a specially designed placer unit which is electro-hydraulically operated. A telescopic jib enables the concrete, which is taken from each mixer in turn, to be placed in the hole. Power for driving the concreting unit is obtained from a diesel-electric generator set mounted on another wagon which also carries pumps for delivering water to the mixers and a rotary air-compressor for operating concrete vibrators and other tools.

This equipment, developed by British Insulated Callenders Construction Co. Ltd. in co-operation with Wharton Engineers (Elstree) Limited and used for the Chelmsford and Southend-on-Sea Victoria extensions, is a prototype of the equipment which will be used for electrification work under British Railways modernisation and re-equipment plan.

The line is bonded throughout for traction return current. Single rails are used where points and crossings occur, but elsewhere all rails are used in conjunction with impedance bonds to segregate the traction and signalling circuits.

Civil Engineering Work

The civil engineering work has been confined to the raising of overbridges to obtain the necessary clearance for the overhead line equipment, the construction of buildings to house the electrical equipment of the substations and track-sectioning cabins, platform lengthening, the strengthening of embankments and cuttings and relaying and deep ballasting of the permanent way.

Structure reconstruction has been limited in comparison with other schemes. As there were no major line widening or permanent way changes the principal work of construction was limited to the raising of the decks of overbridges for overhead line equipment clearances. Altogether nine overbridges have been reconstructed, and two of these were simultaneously widened at the request of the Local Authority.

The works were similar to those carried out on other recently completed electrification schemes and consisted of the demolition of the brick arches of the overbridges, followed by the raising of the abutments to the required level to support the prestressed pre-cast concrete beams which formed the new soffits of the bridge decks. These are of shallow depth so that the tarmacadam or top surface dressing on the screeded deck slabs could be laid to the original road surface levels. In addition, five steel footbridges were modified and raised for overhead line clearances.

Architectural work in connection with the scheme was restricted to the design and construction of the substations and track-sectioning cabins for the electric power supply equipment and a new relay room for signalling equipment at Wickford. The buildings are of brick and concrete construction and are similar to those in use on the Liverpool Street - Chelmsford line. Three new substation buildings were constructed at Ramsden Bellhouse, Rayleigh, and Prittlewell respectively and track-sectioning cabins at Billericay, Fanton Hall, and St. Mary's.

All passenger stations from Shenfield to Southend-on-Sea Victoria have been cleaned and repainted and a programme of platform lengthening, better lighting and improved waiting room accommodation is in progress.

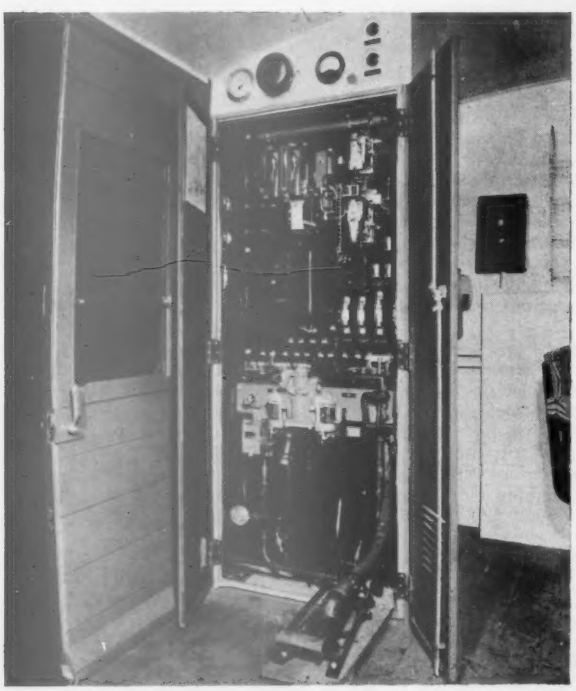
Permanent Way

Before the programme of bridge reconstruction and the structures for the overhead line equipment were erected considerable track maintenance was undertaken. This work was to bring the track to modern standards of maintenance and involved new track drainage, strengthening of embankments and cuttings and the provision of counterforts where necessary. Relaying of the track and deep re-ballasting over some 16 miles of route were further contributions to the preparation of the track for electric traction.

Additional mechanical aids to track relaying and ballasting were used to a greater extent than previously with advantage in carrying out the programme which preceded the work of the Electrical and Signal Engineers' Departments in order to lessen interference with traffic and to make maximum use of track occupations. Careful planning of the work enabled the mechanical plant available to operate over longer periods with greater efficiency and economy.

Signals and Telecommunications

Colour light signalling operated by d.c. electric power was installed between Shenfield and Southend-on-Sea Victoria in 1938, but the use of 1,500-V., d.c. power for traction in the electrification has necessitated the con-



The L.T. equipment cubicle and pantograph foot pump in van compartment

Driving compartment in driving trailer, showing layout of the controls

version of the signalling equipment to a.c. operation to avoid interference. The existing signals have been retained but all the d.c. operated controlling equipment has been converted to a.c. operation.

The conversion involved the substitution of a new cable route for existing overhead wires for telecommunication circuits. Signalling and telecommunications cables are now carried in concrete troughing at ground level and where the route has to be above ground, the cables are carried on concrete stakes.

All signalling and the 170 track circuits on the Shenfield - Southend-on-Sea Victoria line have been converted to a.c. operation and impedance bonds installed in 112 of the track circuits. The impedance bonds are installed between the rails at the ends of adjacent track circuits and are connected to provide a path for the traction return current.

A new relay room has been constructed at Wickford, and together with existing relay room at Southend-on-Sea Victoria, used to house the signalling equipment. In addition 112 lineside apparatus cases have been installed. Almost 1,000 relays have been used. The relays are of the plug in type which can be rapidly changed and facilitate maintenance.

The existing d.c. searchlight signals have been retained and operated from a 110-V., a.c. supply through a step down transformer and selenium rectifier. Independent double filament lamps used in the signals have been increased in wattage, 12-W. main and 16-W. auxiliary lamps having been fitted in place of the 6-W. main and 9-W. auxiliary lamps previously employed. There are 69 colour light signals on the Shenfield - Southend-on-Sea Victoria line, of which 53 are three-aspect and 16 four-aspect signals.

Power Supply

Power supply for the signalling is provided at 650 V., a.c. 50-cycles from the transformers at the electric traction-substations at Ramsden Bellhouse and Prittlewell. Alternative supplies from the Eastern Electricity Board are available at Prittlewell, but only one source is available at Ramsden Bellhouse. To provide against any failure of the supply at the latter substation a standby diesel generator has been installed. This has an output of 20-k.V.A. and it will cut in automatically in event of failure of the normal power supply, undertaking full load in about 7 sec.

Rolling Stock

New rolling stock has been specially designed, and 32 all-steel four-coach multiple-unit sets have been built at British Railways Carriage & Wagon Works, Eastleigh. Each unit consists of a driving trailer, motor coach, trailer, and second driving trailer, providing in each unit 19 first class and 344 second class seats. Of the latter, 140 are in open-type vehicles with central passageway and the remainder in compartment-type coaches. The first class sections of compartment coaches have side corridors. There are four toilet compartments in each unit, two in the trailer and two in the open second class driving trailer. The equipment has been designed to operate a 60-min. limited stop service.

Current is collected by a pantograph on the motor coach and passes to two overload relays, one in each leg of the four-motor equipment. The two axle-hung, nose-suspended motors in each bogie are connected permanently in series, control being by series or parallel connection of the two pairs, with bridge transition. Either pair of motors can be isolated by means of a hand-operated motor cut-out switch which also make the necessary modifications in the control circuit. Continuous and one-hour ratings of a unit are as follow:—

—	Full field	Weak field
Continuous rating of unit ..	632 h.p.	696 h.p.
One-hour rating of unit ..	800 h.p.	880 h.p.

The motors are self-ventilated and take in cooling air direct through protected inlets on top of the frames. The electro-pneumatic contactor control equipment, with the relays, reversers and motor cut-out switch, is accommodated in three cases mounted in the motor coach underframe and is operated from master controllers in the driving trailers, there being no driving compartment in the motor coach because of its intermediate position in the unit. A shunting notch and three running notches are provided, the former having a rating to permit shunting movements and other slow running with all resistance in circuit.

Movement of the controller handle to the series, parallel, or weak-field positions, initiates automatic acceleration to the selected notch. One section of resistance is in circuit only on the shunting notch, its subsequent elimination assisting in the balancing of the circuit for the bridge transition. There are nine resistance notches in the automatic progression to full series and four to full parallel.

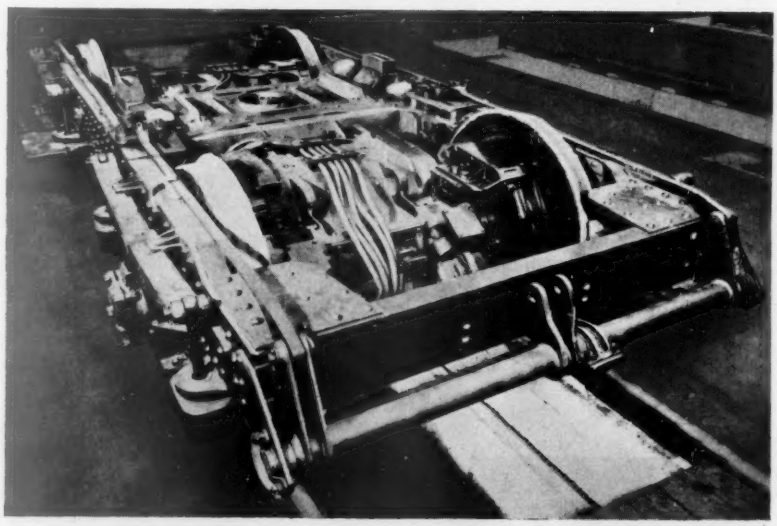
During acceleration in parallel the corresponding sections of resistance in each motor branch are short-circuited together.

There is one weak-field running notch, but this is reached through an intermediate step in which a portion of the motor fields is diverted by resistances. In the final step the fields are weakened by tapping. To reduce the demand when taking the weak-field steps and also to keep the current peaks within reasonable limits, a separate current limit relay is used, having a lower drop value than the main relay.

Acceleration

Two rates of acceleration can be selected by alternative "forward" positions of the reverser handle. The normal rate corresponds to 1·1 m.p.h.p.s., while the lower rate, intended for use in greasy rail conditions, is 0·85 m.p.h.p.s. When the higher rate is selected, the drop values of the main and weak-field current limit relays are modified by means of shunt coils. Operation of an overload relay causes a protective resistance to be brought into circuit before the current is broken finally by a line switch.

When an overload relay trips, auxiliary contacts energise an indicating relay and cause a lamp to light in the van compartment of the motor coach affected. This relay latches in, so that the lamp is not extinguished when the overload relay is reset by pushbutton from the driving cab and remains alight to identify the faulty unit (provided the train line key switch is in position) until the indicating relay has been reset by



Motor bogie, showing arrangement of equipment

hand. In the event of supply failure a no-current relay opens all the switches and contactors. The equipment will renotch automatically to the condition dictated by the position of the master controller handle when the supply is restored.

The auxiliary supply to the motor-generator set, the Westinghouse type CM38 compressor and coach heater lines is taken from the pantograph through a 60-amp. main auxiliary fuse, which provides adequate protection should the compressor contactor, M.G. fuse or heating fuses fail to clear. Fault currents in the auxiliary machines are limited by a protective resistance. A 20-ohm resistance on the negative side of the compressor motor limits its starting current. This machine and the motor-generator set are started direct to line, by means of all-electric contactors.

A resistance having part of its value on the positive side of the M.G. set motor and part on the negative side provides stability for through currents, as at starting; the positive section limits the fault current in case of a flashover to earth in the machine. The input to the motor at 1,350-V. is 10·1-amp. at 1,625 r.p.m.

The L.T. generator is rated at 9·5-kw. 52 V., 183 amp. (continuous), and provides an output, controlled by a carbon pile voltage regulator for the control circuits, battery charging, train lighting and water heating. Series turns are provided on the voltage regulator to give an overall decompounding characteristic so that the voltage is reduced and the charging current restricted if the battery is in a low state of charge.

A feed is taken through a main water heater fuse to the bus line supplying the four 1½-kW., one-gal. water heaters in a train unit. The water heaters are thermostatically controlled by means of contactors in underframe equipment cases, which also house local isolating switches for each pair of water heaters and individual circuit fuses. Each motor-generator set supplies the lighting in its own four-coach unit. A lighting main fuse provides overall protection, but sub-circuit fuses protect the individual coach lighting groups. Train lighting is controlled by a contactor which incorporates set and trip gear.

A Nife 55-amp.-hr. type ES5 alkaline battery is carried on the underframe of the motor coach and will supply the control circuits and essential marker lights of a 12-car train for some 2 hr.

Control Equipment

A cubicle containing the majority of the L.T. control equipment is housed in a van compartment in the motor coach. A foot pump for raising the pantograph is also housed in the cubicle and can be hinged down into the operating position after the door has been opened. When the pantograph is raised by the pump the auxiliary relay which completes the circuit for closing the compressor and MG contactors is set by hand, so that the machines start as soon as the pantograph touches the overhead line. When air is available, however, the pantograph is raised by pressing the push-button in the driving trailer, this section closing the auxiliary relay electrically.

On operating the push-button in the driving trailer, the auxiliary relay is tripped; its contacts de-energise the heater, M.G., and compressor contactors, so that the possibility of breaking current at the pantograph pan is precluded. If for any reason it is necessary to shut down the motor-generator set from the van position, the isolator in the equipment cubicle can be opened to de-energise the M.G. contactor.

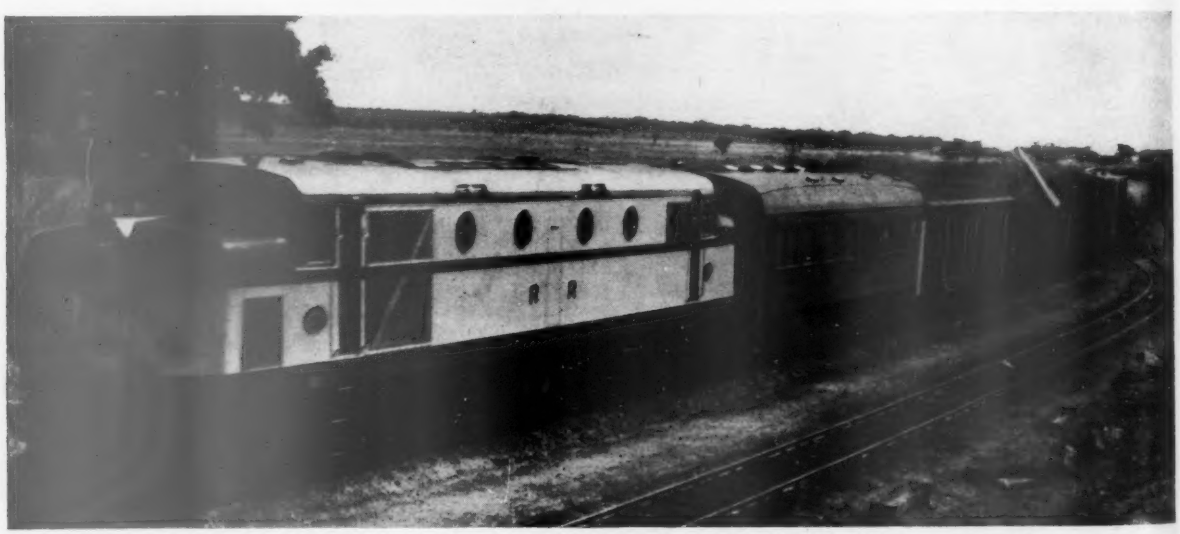
The 1,500-V. supply to the train heating lines is taken from the negative side of the main auxiliary fuse through a contactor and a fuse for each line. The carriage heaters, fitted under the seats, are rated at 500 W. and are connected five in series. Passenger heaters are thermostatically controlled. All the electrical equipment for the new rolling stock was supplied by the General Electric Co. Ltd.

The electrical engineering work was carried out under the direction of Mr. S. B. Warder, Chief Electrical Engineer, British Railways Central Staff, British Transport Commission, Mr. J. A. Broughall, Electrical Engineer (Development), British Railways Central Staff, B.T.C., and Mr. K. J. Cook, Chief Mechanical & Electrical Engineer, Eastern Region, the civil engineering work was under the direction of Mr. A. K. Terris, Chief Civil Engineer, Eastern Region, and the signalling and telecommunications was under the direction of Mr. R. A. Green, Signal Engineer, Eastern Region.

The following is a list of principal contractors:—

Electrical equipment (rolling stock)	General Electric Co. Ltd.
Overhead line equipment, supervisory & pilot cable	British Insulated Callenders Construction Co. Ltd.
Substation & track, sectioning cabin equipment	British Thomson-Houston Co. Ltd.
Power cables	Johnson & Phillips Limited
Signalling supplies, standby plant	A. C. Morrison & Co. (Engineers) Ltd.
Bridges	Wellerman Bros. Ltd.
Drainage & earthworks ..	W. & C. French Limited
Permanent way	Tersons Limited
Footbridges	Butterley Co. Ltd.
Track sectioning cabins ..	Barker & Pinkney
Substation buildings ..	Hosking & Son (Essex) Ltd.

Diesel-Electric Traction in Rhodesia



One of the 23 *English Electric* 2,000-*h.p. main-line diesel-electric locomotives supplied to the Rhodesia Railways*

Western Uganda Railway Extension

Survey and construction of this 208-mile line

FROM time to time during the past half-century schemes have been put forward, and in several instances investigated by field survey, for a railway to open up Western Uganda and form a communication with Congo territory. These proposals and surveys and historical notes on railway development in Uganda, together with others on the country traversed by the important construction now completed are embodied in an editorial article on another page.

The favourable reports on the potential output of copper and cobalt from the Kilembe mine in the Ruwenzori Mountains near Kasese, if these minerals could be moved by rail, brought to a head these proposals in 1951. The revised project then depended for its justification upon the cheapest line compatible with a high standard of construction to Kasese, about 40 miles short of the Congo border.

Country Traversed

Therefore, instead of following the main road from Mityana, as previous surveys had done, to tap more developed country, the new route selected struck due westwards along the Katonga valley leading directly to the watershed between the Lake Victoria and Lake George basins overlooking Kasese. The gradually-rising Katonga valley thus provided an ideally direct alignment to within about 10 miles of the watershed. These 10 miles were across rugged difficult country, and on the far side of the watershed is a 1,000-ft. escarpment descent, followed by about 15 miles of deep swamp leading almost to Kasese, both involving very difficult and costly construction work, after unusually interesting survey.

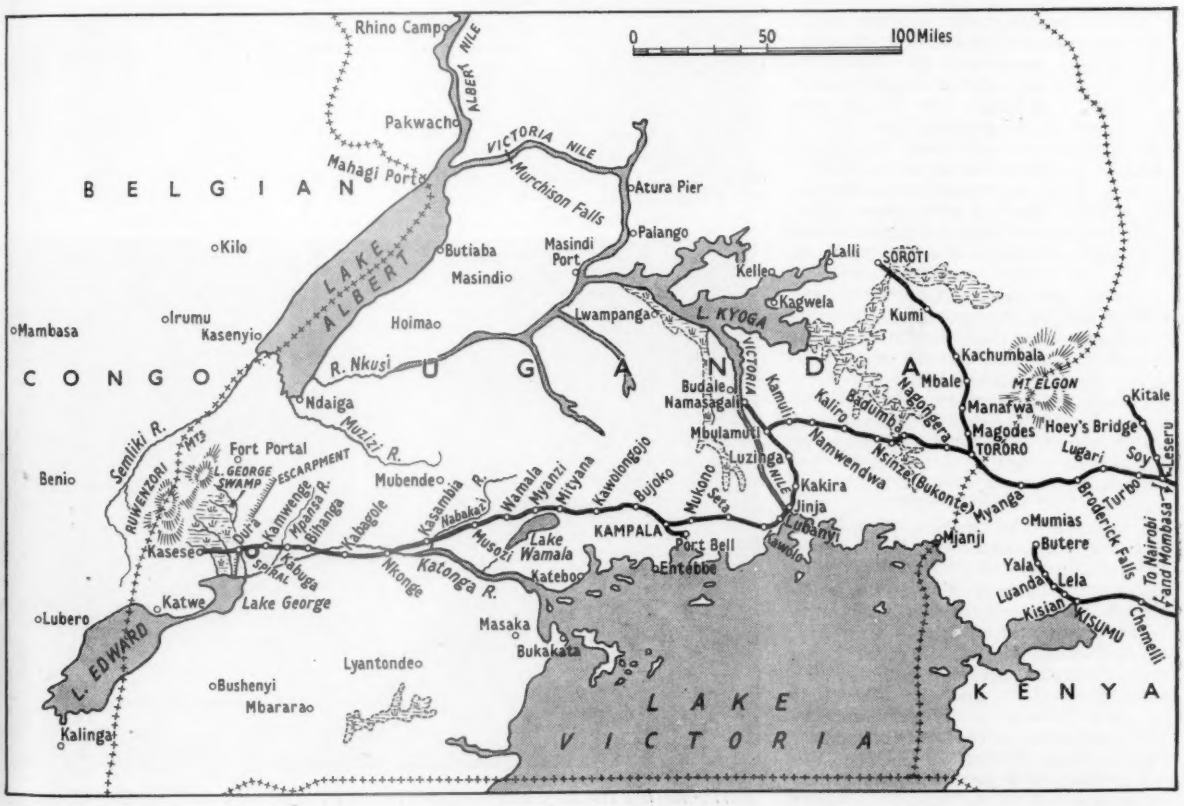
Features of the Survey

In fact, the survey work calls for some description. Though the preliminary survey up to the head of the Katonga valley was comparatively simple, the remainder was the reverse. Moreover, the whole of it had to be completed in the very limited time of about 10 weeks, the total distance covered being 247 miles to the Congo border and including about 30 miles of branch lines. This feat was possible only because the drawings of 144 miles of previous surveys could be used with suitable adaptation to new standard gradients and curves. Even the Katonga Valley had been surveyed for a canal, so that altogether for the fixing of a paper alignment and the submission of a report and estimates much information was available for about 175 miles of the route to the border.

The most difficult sections were (1) between the Mpanga River (near Kabuga station), mile 163, and mile 196 at the foot of the escarpment, and (2) the 15 miles across the marsh. Reconnaissance of the escarpment area was carried out on foot and by air and eventually a low saddle in the ridge was found that could be reached by using a 1·5 per cent (1 in 67) ruling gradient in the eastern ascent. Subsequent techeometric preliminary survey on this ascent was through difficult broken country requiring heavy jungle clearing and infested with buffalo and elephant ; the work on the escarpment was through almost inaccessible terrain.

Survey on the Escarpment

Here the big drop could be negotiated only by "developing length artificially," partly with the aid of a complete spiral giving access to the face of the escarpment itself at this, the one break in its long steep wall.



The Western Uganda extension, showing relationship to existing lines of E.A.R. & H. and to the Ruwenzori Mountains

This break was actually a series of stepped subsidences in the shape of a wide amphitheatre cut into the escarpment due to geological movements, and gave room for development of the trace with a maximum gradient of 1·18 per cent (about 1 in 85) compensated for curvature. Heavy earthworks were, however, unavoidable, involving cuttings up to 95 ft. deep and embankments as high as 120 ft. The alternative of a 2 per cent (1 in 50) gradient was considered and a trace run at that inclination, but the final decision was in favour of the easier gradient which is against the load of mineral trains from Kasese. Fortunately there was no great length of this most difficult alignment.

Surveying in the Swamp

The narrowest part of the swamp at the foot of the escarpment was ascertained by air survey, revealing only about four miles of water to be crossed. The surveyors carried a 30-ft. steel drill to probe the swamp at intervals. Only in the middle was there found to be more than 20 ft. of water and soft mud deposited over firmer soil ; the average depth was about 15 ft. The firm bottom proved to be sand and gravel suitable for the foundation of a railway embankment. An alternative route round the swamp was shown to involve nine miles' extra length of line and several river crossings, and was not therefore economical.

Final Location Survey

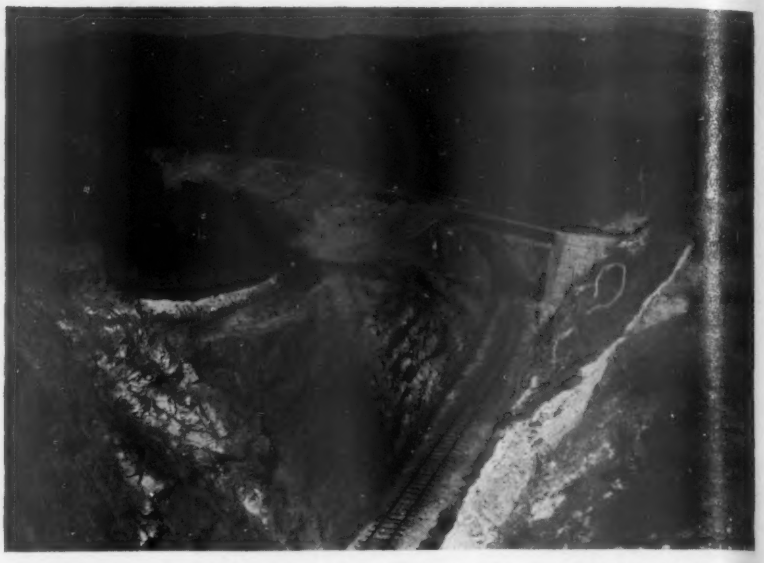
On the ascent to the watershed final location was tortuous and on the descent of the escarpment the high standard of gradients and curvature made it abnormally difficult. In the 15-mile length of ruling gradient two station sites had to be allowed for. The movement transversely of the centre line by even a foot or two seriously affected the volume of earthwork required on such steep side slopes ; frequent staking and restaking was necessary to reduce this volume to a minimum.

Setting out across the swamp was carried out by triangulation, and relative levels were then checked by sight levelling across the 4-5-mile water gap, with due allowance for the curvature of the earth's surface. In all the survey work rationing and servicing had to be carried out by head-porterage to the various camps.

Construction Begun

Construction of the first 45 miles to Mityana was sanctioned in January, 1951, and a sum of £750,000 was allocated to it ; the remaining 163 miles to Kasese were sanctioned a year later. Work began at Kampala in February, 1951, half the initial 45 miles being undertaken by contract entirely with mechanical plant, and the other half by direct labour, partly mechanically. This section was completed and opened for traffic on August 1, 1953.

Construction beyond Mityana had to be carried out 50 per cent by contract and the remainder by departmental labour, as sufficient contractors were not available to undertake more. This necessitated purchase by the Government of much expensive earthmoving plant, and also an organisation to control it including the training of staff, and workshops at Mityana as soon as railhead arrived there.



Spiral approach to the escarpment to develop length on this 1,000 *ft. descent*

Earthmoving Plant

The plant consisted of three units each comprising seven tractors and scrapers—some 8-yd. and some 12-yd.—and a unit of four Tournapulls for long-lead work. In addition, RB19 and RB10 excavators were used for feeding rail wagons with spoil. Moreover, the contractors had their own plant, and altogether as many as 60 tractors and scrapers were in service at one time. As an example of the difficulties connected with the transport of this plant it may be mentioned that for throwing an embankment across the marsh a 25-mile service road had to be built from the nearest public road to the east side of the swamp below the escarpment. Over this service road were carried the component parts of two RB10 excavators, 12 small locomotives and a corresponding number of tip-trucks, and also 15 miles of light track.

On the escarpment rock conditions were difficult; initial drilling cores showed hard rock with some jointing and fracture and the stability of rock faces when excavated to a slope of ¼ to 1

Earth-moving tractors and scrapers at work. In all over 157,000,000 *cu. ft. of rock and earth were moved, mainly with this type of plant*

was unpredictable. Weathering resulted in considerable slips and falls and many cuttings had to be excavated to 1 to 1 slopes before stability was achieved. Excavation of this material was also difficult, as it was neither solid enough for blasting efficiently nor sufficiently broken up to allow of ripping out with mechanical plant. In practice, a combination of drilling, blasting, loosening, and ripping broke up the material and enabled it to be moved away by scraper. The presence of quartzite caused heavy wear and tear on scrapers and tyres. Very steep side slopes, narrow ridges and gullies were a problem for the operation of earthmoving plant, and difficult service tracks had to be cut to bring plant to the site of each cutting and bulldoze spoil into the gullies until a reasonable working angle for tractors could be obtained. As fills were mainly of broken rubble their consolidation raised no serious problems.

Tracklaying in typical country east of the watershed

Embankment Across the Swamp

The construction of the swamp embankment largely in 15 ft. of water necessitated the employment of 1,000 men for 2¾ years, assisted by the excavators and light railway plant working out to bankhead. On the west side of the swamp the land was so little above swamp level that only shallow excavation was possible. The throwing up of the embankment caused a head on the water level and pipe-openings were inserted to reduce it. However, it was found that they caused scour and eventually had to be plugged.

Bridgework

The bridging of the many swampy rivers east of the watershed was not so difficult as expected because the depth of vegetation silt down to firm subsoil seldom exceeded 15 ft., and the rise and fall of the river levels was gradual and velocity was never high. Balance openings only were therefore necessary, sometimes built on the high banks of the rivers with economical foundation work. Where bridges had to be built in the middle of rivers the cheapest method of construction was to widen the embankment at those points sufficiently to form a cofferdam within which foundation excavation and concreting could be undertaken with some pumping.

The bridge in the middle of the swamp was built in this way. Its piers consisted of pairs of 8-ft. dia. R.C. cylinders with 18-in. walls sunk under their own weight with the aid of internal excavation by Priestman grab worked by mobile crane. Firm foundation was found about 40 ft. down, when the cylinders were test-loaded with kentledge and finally capped; the spans are 60 ft.

Another unusual bridge was that over the Dura River on the lower part of the escarpment. Due to uncertainty regarding delivery of steelwork and difficulty in getting it to this site, a 25-ft. concrete arch was designed for this bridge. The railway embankment was sited on the edge of a waterfall and the downstream arch-culvert headwall was therefore designed as a retaining wall to contain the embankment. To prevent erosion and cutting back of the downstream rock face by water cascading out of the culvert, the outlet of the culvert was provided with a lip curving upwards to throw the cascade clear into a stilling pool some 40-50 ft. below. As the discharge of the Dura varies from 20 to 800 cusecs, its diversion during construction and the building work gave rise to interesting problems. The arch has a 10-in. thick crown and is surcharged with a 75-ft. embankment.

A feature in the design of many of the bridges is a reinforced concrete cantilever wingwall, making possible considerable economies in foundations and concrete quantities; they have proved entirely successful.

Construction Organisation

The construction organisation consisted of a Resident Engineer with headquarters staff of a deputy and assistants, drawing and clerical staffs. Under him were five Section Engineers each with a length of from 23 to 69 miles, rather too long but necessary due to shortage of technical staff. The Section Engineers controlled both contract and departmental work on their sections.

Transport and communications in much of the country traversed were difficult. However, high-frequency radio transmitting and receiving sets were installed at all important camps, and two daily intercommunication broadcasts were held. Water supplies also proved difficult in many areas and much drilling was entailed. Only three rivers provided suitable supplies by gravity or pumping.

Permanent Way

As mentioned above, the ruling gradients of 1 in 85 against the load and 1 in 67 against westbound trains are compensated for curvature. In general, the maximum curvature is 8 deg. or 716 ft. radius, but where economies in formation could be achieved in difficult terrain 10-deg. or 573-ft. radius curves were permitted. Standard cubic-parabola transition curves are used throughout.

For the platelaying and earth ballasting 1,000 men were employed under 3 or 4 Permanent Way Inspectors. The rails are of 50-lb. section throughout, and are laid on pea-pod steel sleepers. Some 1,000 tons of granular-type earth ballast were excavated, loaded, carried, unloaded and used for packing and boxing in each mile of line. Owing to lack of stone ballast at reasonable cost, this granular earth was used as the next best form of ballast.

Thanks to the small variation in temperature in this equatorial area ¼-in. hardwood shims were used temporarily for spacing the rail joints.

The total cost of this 208-mile construction is placed at some £5,150,000 or roughly £24,000 a mile. Of this total, formation cost £1,899,000, bridging £391,000, buildings of all kinds £650,000, and permanent way £700,000. The quantities involved in the construction of the formation were (*a*) blasting and removing rock 22,500,000 cu. ft. (650,000 tons), and (*b*) about 135,000,000 cu. ft. of earth excavated.

Construction was completed in August, 1956, and the ceremonial opening was performed by H.E. Sir Andrew Cohen, Governor of Uganda, on November 23, as recorded in *The Railway Gazette* of that date.

Successive Resident Engineers in charge were Mr. P. H. Hicks (November, 1951—September, 1953), Mr. C. L. Keegan (September, 1953—August, 1955,) and Mr. J. M. Fogarty (from August, 1955).

Radio-Telephony at Feltham Marshalling Yard

Equipment installed by Southern Region for hump control

THE Southern Region of British Railways has installed radio-telephone equipment at Feltham Marshalling Yard. This yard is worked on the gravitation principle with one hump in the Down Yard and one hump in the Up Yard. From the reception sidings wagons are shunted over a hump in the usual manner to a series of tracks on the opposite side which spread out fanwise from the foot of the hump.

Movement of trains towards the humps is controlled by semaphore signals, and during foggy or inclement weather use has been made of Klaxon horns to indicate to the driver the movements requiring to be made. With the introduction of diesel locomotives for humping, however, it was found that drivers were unable to hear the Klaxon horns, and in consequence general slowing up of the humping operations was experienced. It was therefore decided to install short-range radio-telephony which would enable the pointsman to communicate with the drivers of the diesel locomotives and vice versa.

Separate Frequencies

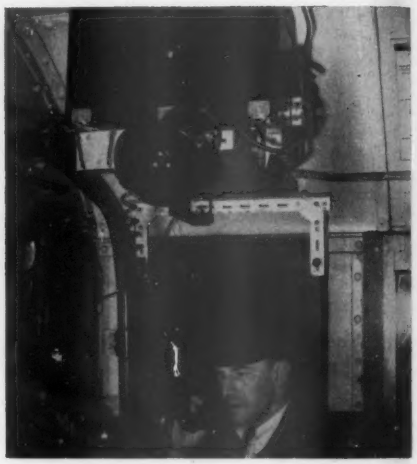
Two fixed stations have been installed, one at each hump control box, each station working on a separate frequency. The two diesel locomotives used for humping, and also one standby diesel locomotive, have been equipped with receivers, thereby enabling messages to be received and acknowledged to either hump box.

Before commencing shunting, the installation on the diesel locomotives is switched to receive messages from the appropriate hump box and the equipment is then locked in that position to ensure that messages can only be received from that pointsman.

The equipment was supplied by Pye Telecommunications Limited and installed by the Regional staff. It is of a standard type for mobile use but special care has had to be taken to overcome the severe vibrations experienced on the diesel engines. The equipment in the signalboxes is operated from the supply mains and the diesel locomotive sets are operated from a 12-V. battery charged automatically from the 90-V. starter battery already fitted to the locomotive. The voltage variation of the 90-V. battery is too great for it to be suitable for direct operation of the sets.

As the maximum range required is less than one mile, the sets are operated at very low power. The new apparatus is expected to enable marshalling operations in conditions of bad visibility to be carried out much faster than hitherto.

Pointsman using one of the control point installations to talk to the driver of a diesel shunting locomotive



Driver using apparatus. The equipment is mounted above his head

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WEST MIDDLESEX GROUP OF INSTITUTE OF TRANSPORT FORMED.—The approval of the Council and of the Metropolitan Section having previously been given, a meeting to discuss the formation of a West Middlesex Group of the Institute of Transport took place on December 11, 1956, in the conference room of the Ministry of Transport & Civil Aviation, Control Tower Building, London Airport. The chair was taken by Mr. Keith Granville, a former Member of Council, Commercial Director of B.O.A.C., and there was an attendance of more than 50. Mr. Granville was supported by Mr. S. G. Hearn, a former Member of Council, Vice-Chairman of the Metropolitan Section, Chief Operating Superintendent, British Railways (Western Region). After Mr. Granville and Mr. W. Bray, Member of Council, had spoken, it was unanimously decided to form the Group to consist of those members, of all grades, employed or resident in the County of Middlesex west of a line through Kew Bridge and Pinner who signified their wish to join the Group. An inaugural committee was elected with Mr. Granville as Chairman. Mr. Hearn welcomed the new Group on behalf of the Metropolitan Section and wished it every success.

CLEAN-UP AT DERBY STATION.—Work is in progress on washing down and repairing the stone and brickwork as a final touch to the reconstruction of the whole of Derby Midland Station, which has been proceeding for the last three years. Many sections of the stonework are being cut back, non-ferrous metal reinforcing introduced, and plastic stone applied gradually until the original thickness has been built up. The process will bring back to their original appearance some excellent carvings on the clock tower. Finishing touches are also being given to the station interior. The old original stone platform wall, which dates back to 1840, is being partly demolished for the reconstruction of the new No. 1 platform in concrete units. It has been possible, however, to leave a part of the stone wall intact. This portion of the original platform wall can be seen when standing on No. 2 platform near the parcels subway.

RAILWAY RECRUITMENT OFFICES A YEAR OLD.—The British Railways recruitment centre in Euston Square dealt with nearly 40,000 applicants for jobs during the first year from opening on December 19, 1955. The applicants included Hungarians, Egyptians, Cypriots, Maltese, Germans, French, West Indians, and Pakistanis. Some 40 per cent were British. It has not been possible to place any Hungarians or Egyptians in railway employment, because of language difficulties. The other British Railways centre, in Birmingham, dealt with some 19,000 applicants within the same period.

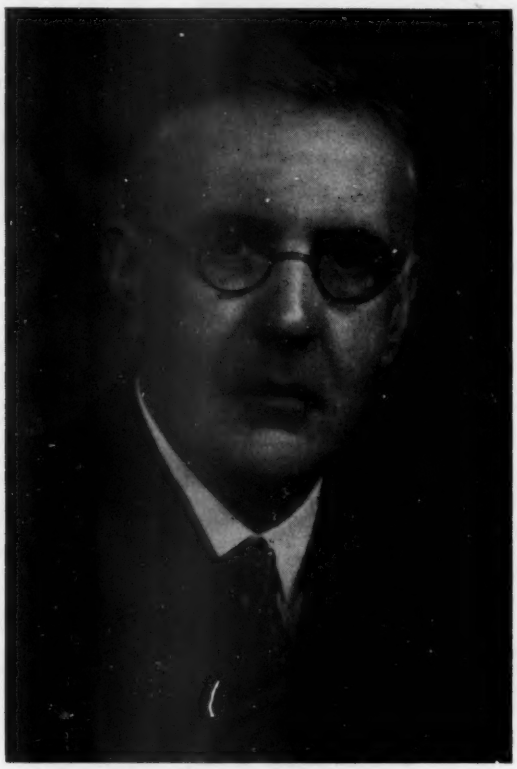
RAILWAY NEWS SECTION

PERSONAL

Mr. L. C. Gardner, General Manager, Gold Coast Railway & Harbours Administration, has retired. He has been succeeded by Mr. H. F. P. Plumridge, Assistant General Manager, Nigerian Railway. Mr. Plumridge will take up his new appointment in March and, until then, Mr. J. K. Dougall, Deputy General Manager, is acting as General Manager of the Gold Coast system.

Mr. H. H. Phillips

Retired Assistant General Manager, Western Region, appointed Permanent Member, Transport Tribunal



Mr. A. E. Sewell

Permanent Member, Transport Tribunal, 1949-57, appointed member of the Special Panel

Mr. Herbert H. Phillips, O.B.E., A.C.I.S., M.Inst.T., Assistant General Manager, Western Region, British Railways, retired from railway service on December 31, and H.M. The Queen has approved his appointment as a Permanent Member of the Transport Tribunal as from January 1, 1957. Entering the service of the Great Western Railway in 1908, Mr. Phillips gained wide experience of railway administration as a member of the General Manager's personal staff until 1932. During that period he was for some years in charge of the section dealing with freight rates and charges, passenger fares, docks, marine and general traffic subjects. He also acted as Secretary of the Cork City Railways before their acquisition by the Great Southern Railways. In 1932 he was transferred to the office of the Superintendent of the Line to reorganise the company's excursion and cheap ticket facilities and was largely responsible for the introduction of monthly return tickets. At the end of 1937 he became Assistant Divisional Operating Superintendent and, in 1941, Divisional Superintendent at Cardiff. During the war he was a member of the Cardiff and Barry Port Emergency Committees. In 1946 he was appointed Assistant to the Superintendent of the Line, and, in 1948, returned to Paddington as Assistant Chief Regional Officer, Western Region, British Railways. In January, 1950, he became Chief Commercial Officer of the Railway Executive, and subsequently of the British Transport Commission. In 1953, at the request of the Premier of Tasmania, he investigated the working of the Government Railways in that country and a number of the recommendations he made to improve the financial results of the undertaking have since been adopted. Mr. Phillips was closely associated with the preparation of the British Transport Commission's Modernisation Plan and was Chairman of the Committee which formulated the proposals for substituting steam by diesel and electric traction. He returned to Paddington in February, 1954, to occupy the position from which he now retires, and has since taken a prominent part in the plan to introduce diesel-hydraulic locomotives on the Western Region. He has been a strong advocate of regular-interval passenger trains and was largely responsible for the reorganisation of services in the Cardiff area, which was the forerunner to many similar revisions elsewhere. A former Member of the Council of the Institute of Transport, Mr. Phillips was Chairman for 1947-48 of its South Wales and Monmouthshire section. He is also an Associate Member of the Chartered Institute of Secretaries. In 1954 he was awarded the O.B.E. for his services as Chief Commercial Officer, British Transport Commission.

Mr. A. E. Sewell, M.Inst.T., Permanent Member of the Transport Tribunal since 1949, relinquished that position on December 31. He has been appointed a member of the special panel of the Tribunal Mr. Sewell, who until 1949 was Charges Adviser to the British Transport Commission, was born at Whitby and educated at Ackworth School and Bootham School, York. He joined the North Eastern Railway in 1903, and, after gaining experience in various stations and departments, transferred to the General Manager's Office, later taking charge of the Parcels Section of the Passenger Manager's Office. He was subsequently promoted to the Chief Goods Manager's Office, and, from July, 1921, to April, 1922, was released to act as Secretary to the Committee of Goods & Mineral Managers of the "Eastern Group of Companies" which was appointed to co-ordinate the arrangements of the seven component companies in anticipation of amalgamation. In 1923 he was appointed Rates Assistant to the Goods Manager, North Eastern Area, L.N.E.R., and, in 1928, Assistant Goods Manager, Southern Area. In 1934 he became Goods Manager, Southern Scottish Area, and, on the formation of the Scottish Area in 1939, Goods Manager for that area. He was Chairman of the Railway Clearing

Mr. L. A. Morgan
Appointed District Operating Superintendent, Chester, Western Region

Mr. Charles Holt
Appointed General Manager, Thos. Cook & Son, Ltd.

The late Mr. J. B. Figgins
General Secretary, National Union of Railwaymen, 1948-53

House Goods Manager's Conference in 1939 and 1940. In 1942 he was released from his Scottish duties to give full time on behalf of the four main-line railways to the work of the Road-Rail Central Conference of which he had been Chairman since its inception in 1939. His appointment as Joint (Railway) Chairman was made permanent in July, 1945, when he relinquished the position of Goods Manager, Scottish Area, L.N.E.R. In November, 1947, he was appointed Charges Adviser to the British Transport Commission, the position he held at his retirement on September 30, 1949.

Mr. L. A. Morgan, M.B.E., Assistant District Operating Superintendent, Cardiff, Western Region, British Railways, who, as recorded in our December 28 issue, has been appointed District Operating Superintendent, Chester, was educated at King Henry VIII Grammar School, Abergavenny. He joined the former Great Western Railway in the Divisional Superintendent's Office, Pontypool Road in 1923, and served in various clerical posts and at stations in the Newport Division until 1941, when he became Stationmaster at Portskewett. Subsequently he was appointed Assistant Stationmaster at Newport (High Street), transferring to the office of the Superintendent of the Line in 1947 on his appointment as Headquarters Chief Inspector. In this position his duties included travelling on the Royal Train. Mr. Morgan was appointed Assistant to the District Operating Superintendent at Cardiff in 1951 where, in 1954, he became Assistant District Operating Superintendent. While at Cardiff he served as Chairman of the Passenger Services Research Committee, was engaged in planning the reorganisation of local branch line services in South Wales, and was Chairman of committees dealing with dieselisation schemes in South Wales. He received the M.B.E. in the Queen's Birthday Honours in 1952. Mr. Morgan is well known in sporting circles, having played rugby for Abergavenny, Monmouth and Newport clubs and for British Railways teams.

Mr. H. G. N. Read, Assistant Commercial Manager, London Midland Region, British Railways, retired on December 31.

Mr. Charles Holt, who, as recorded in our December 28 issue, was appointed General Manager of Thos. Cook & Son Ltd. on December 14, had been Deputy General Manager since the end of 1948. In July last he was elected Chairman of the Creative Tourist Agents' Conference for the eighth successive year. Mr. Holt was born in September, 1899, and joined Cook's at the age of 20, after serving in the 1914-18 war. His first appointment with the company was in the Rates Department and, within a few months, he was posted to Interlaken and then Naples, Lucerne, and Geneva. At the age of 23 he became Branch Manager at Luxor, working there during the winter and in Stresa during the summer. On returning to England in 1926, he opened the company's Sloane Street office, later taking over the City office and becoming Joint Traffic Manager in 1940. In this position he made it his business to know every member of the staff in the British Isles, visiting each office. His next appointment was that of Traffic Manager for the British Isles, and, in March, 1948, he was appointed Assistant General Manager (Administration), eight months before his appointment as Deputy General Manager.

The British Transport Commission announces the following Headquarters appointments:—

Mr. L. J. Hamblin, Assistant to Chief Operating Superintendent (Research), Paddington, Western Region, British Railways, to be Industrial Relations & Welfare Officer.

Mr. G. H. K. Lund, Assistant (Motive Power), Operating & Motive Power Department, British Railways Central Staff, to be Work Study Assistant.

British Transport Docks announces the appointment of Mr. H. Littlefair as Estate Surveyor, Humber Ports, Hull, as from January 1. He is at present Senior Surveyor, Humber Ports. Mr. H. Littlefair joined the former Docks & Inland Waterways Executive in 1950 as Senior Surveyor in the department of the Estate Surveyor, Humber Ports, the position he now vacates. He is a Professional Associate of the Royal Institute of Chartered Surveyors, a Fellow and Past Branch Chairman of the Institute of Housing, and a member of the Royal Sanitary Institute.

We regret to record the death, at the age of 63, of Mr. James Figgins, General Secretary of the National Union of Railwaymen from 1948 until 1953. Mr. Figgins was born at Largs, Ayrshire, where he joined the local railway at the age of 14. His early railway experience was gained in the Ayrshire and Glasgow area, and, from 1924 onwards, he held many representative positions in the N.U.R. He served as a member of that Union's National Executive Committee, and, in 1938, was appointed Organiser (London). In 1943 he became Assistant to the General Secretary, N.U.R., and, in September, 1947, Acting General Secretary. He was confirmed in the position a few months later. He was a member of the T.U.C. General Council, of the Executive Committee of the International Transport Workers' Federation and of catering wages boards for industrial canteens, licensed and unlicensed hotels.

Mr. H. Bell, District Motive Power Superintendent, Grimesthorpe, Eastern Region, British Railways, has been appointed District Motive Power Superintendent, Newcastle, North Eastern Region.

Mr. T. D. Slattery, General Traffic Manager, Associated British & Irish Railways Incorporated, U.S.A. and Canada, has retired for reasons of health. He was succeeded on January 1 by Mr. G. F. Luther, District Passenger Manager, Birmingham, London Midland & Western Regions, British Railways.

Mr. J. H. F. Read, B.Sc.(Eng.), who has been in charge of the Heating & Ventilation Section of the office of the New Works Engineer, London Transport, since 1950, has been appointed Principal Executive Assistant. He will be responsible to the New Works Engineer for matters concerning the heating and ventilation of London Transport's properties. Mr. Read, who is 46, entered the service of the Metropolitan Railway as an apprentice in 1927.

The following have been elected associate members of the Institution of Locomotive Engineers: Messrs. R. Datta, Works Manager (Carriage & Wagon), Eastern Railway, Kanchrapara, India; J. N. Kapur, Assistant Mechanical Engineer, Western Railway,

Ratlam, India; C. Macdonald, Sales Engineer, Hoffmann Manufacturing Co., Ltd.; C. S. P. Sastry, Research Officer, Railway Testing & Research Centre, Alanbagh, India.

Sir Herbert Merrett, J.P., has resigned his position as Chairman & Director of Powell Duffryn Limited with effect from December 31, 1956. From the same date he is also resigning from the boards of Powell Duffryn's main subsidiary and associated companies. Sir Henry Wilson Smith, now Deputy Chairman, became Chairman as from January 1.

Mr. V. F. W. Cavendish-Bentick has been appointed an additional director of Skefko Ball Bearing Co. Ltd.

Mr. W. H. Naylon, District Manager of the Manchester tyre depot of the Dunlop Rubber Co. Ltd. since 1929, retired at the end of the year.

Mr. Homer F. Wilson has been appointed Superintendent Transportation of the Illinois Central Railroad at Chicago. Mr. Charles S. Condon will succeed him as Superintendent Passenger Service.

Mr. Albert T. Evans has been appointed General Agent and Mr. Norman C. Garling, Commercial Agent at Memphis, of the Illinois Central Railroad. Mr. Clay B. Morris succeeds Mr. Garling as Commercial Agent at Louisville.

Mr. P. S. Welham has succeeded Mr. R. A. Smyrk as Staff Manager of Thos. Cook & Son Ltd., and not as Assistant General Manager (Traffic), as stated in our December 28 issue.

The following appointments in the Vickers group have been announced: Mr. E. E. Kennaird (Sales Manager) has joined the board of Cooke, Troughton & Simms Ltd. Mr. H. F. Judd, General Sales Manager of loco Limited has joined the board of that company.

Dr. Ronald Holroyd, Director in charge of research, has been elected a deputy-chairman of Imperial Chemical Industries with effect from January 1, in place of Mr. A. J. Quig, who is retiring after nearly 50 years' service with the company and its predecessors.

We regret to record the death on December 19, in a road accident, of Mr. Geoffrey N. Roberts, Helsby Works Manager of British Insulated Callender's Cables Limited. Mr. Roberts, who was 51, joined the Power Cable Department of the former British Insulated Cables Limited at Prescot in 1924.

Thos. W. Ward announces the appointment of six Local Directors from January 1, 1957. These are as follow: Mr. Ernest Springthorpe, Mr. C. Norman Bradshaw, Mr. Eric Wolstenholme, Mr. George Page, Mr. Reg. Hadfield, and Mr. Alfred Kissack. All the new Local Directors have spent their entire business lives with the company.

The Chloride Group announces that Mr. T. Dawson has taken up the new position of Group Export Sales Manager and will also be responsible for commercial liaison with the group's overseas associate companies. Mr. P. C. Aspinall, formerly Assistant Export Manager, succeeds Mr. Dawson as Export Manager for Chloride Batteries Limited.

Sir Fred G. Thorpe has joined the board of Vickers Australia Pty. Limited of Melbourne.

Mr. S. R. Saunders, Salaries & Pensions Secretary to the Dunlop Rubber Company since 1938, has retired because of ill-health.

Mr. Frank Rowe has been appointed a director of the George Cohen 600 Group Limited, the holding company which controls the 600 Group.

A West Middlesex Group of the Institute of Transport is being formed. At a meeting at London Airport on December 11 the following members were elected to form the inaugural committee:—

Chairman: Keith Granville (B.O.A.C.).
Vice-Chairmen: Two to be appointed by the Committee.
Hon. Treasurer: W. Bray (B.O.A.C.).
Hon. Secretary: J. W. Swann (B.E.A.C.).
Committee: W. Armstrong (B.O.A.C.), G. S. Bingham (London Transport), D. O. Bustard (B.O.A.C.), E. T. House (B.O.A.C.), L. N. Morton (Willow Wren Canal Carrying Company), J. Powell (British Railways, Western Region), W. I. Scott-Hill (B.E.A.C.), R. L. F. Woodhouse (Nestle).

We regret to record the death in Vienna on November 21, of Dr. Johann Rihosek, a former Chief Mechanical Engineer of the Austrian Ministry of Railways. He was in his 88th year. At first in the service of the well-known Floridsdorf locomotive works, he joined the State Railway Ministry in 1897 under the celebrated engineer Karl Gölsdorf, on whose death in 1916 he became head of the department. He was responsible for a number of designs of engine, particularly some powerful freight classes. Dr. Rihosek retired in 1924 and for some time was lecturer in locomotive engineering at Vienna Technical College.

Mr. H. Roos, Chairman & General Manager, Finnish State Railways, has retired. He has been succeeded by Mr. Erkki Aalto.

Lt.-Colonel L. F. R. Fell has been appointed to take charge of a centralised sales organisation to be set up by Rolls-Royce Limited. The formation of the new organisation is an indication of Rolls-Royce's view of the importance of the railcar side of the company's oil engine business.

Mr. W. Spence has been appointed Manager, Industrial Engineering Department, British Thomson-Houston Co. Ltd., succeeding Mr. W. J. Pool, who will devote his full time to special duties with the company.

Mr. A. G. Morley has been appointed a Director of F. J. Lyons Limited, the London public relations consultancy. He joined the company in 1955, after seven years as Press Officer of Thos. Cook & Son Ltd.

On the retirement, for health reasons, of Mr. G. W. Preston, General Manager, Copper Development Association, Mr. R. B. F. Wylie has been appointed to the new position of Director of the Association.

Mr. J. Bulman has retired from the boards of R. & W. Hawthorn Leslie & Co. Ltd. and its subsidiaries, and has relinquished his position as Managing Director of Hawthorn Leslie (Engineers). Mr. D. G. Ogilvie succeeds him in these positions.

Mr. Owen Hugh Smith has resigned as Chairman of the Proprietors of Hay's Wharf, while retaining his seat on the board He will become the first President of the company. Sir Rupert de la Bere has been appointed Chairman.

The New Year Honours List

The following is a selection of New Year Honours of transport interest:—

G.B.E.

Sir Archibald F. Forbes, Chairman, Iron & Steel Board.

G.C.V.O.

Sir Harold Hartley, Vice-President, L.M.S.R., 1930-45.

K.B.E.

Mr. F. A. Kirby, General Manager, East African Railways & Harbours Administration.

Mr. G. F. Stedman, Deputy Secretary, Ministry of Transport & Civil Aviation.

Knights Bachelor

Mr. J. F. Pascoe, Chairman & Managing Director, British Timken Limited.

Mr. J. C. L. Train, Member, British Transport Commission.

C.M.G.

Mr. J. A. Fargher, Railways Commissioner, South Australian Railways.

C.B.E.

Mr. D. C. Brown, Chief Mechanical Engineer, Office of the Crown Agents for Oversea Governments & Administrations.

Mr. J. W. Haughton, Chairman, Northern Ireland Tourist Board.

Mr. A. E. Manning, Assistant Secretary, Ministry of Transport & Civil Aviation.

O.B.E.

Mr. W. G. Bawden, Head of Department Class B, Office of the Crown Agents for Oversea Governments & Administrations.

A. W. Clarke, Principal, Ministry of Transport & Civil Aviation.

Mr. G. F. Fiennes, Operating Superintendent, Eastern Region, British Railways.

Mr. J. Nadin, General Manager & Director, D. P. Battery Co. Ltd.

M.B.E.

Mr. P. J. Allen, Inspecting Engineer, Office of Crown Agents for Oversea Governments & Administrations.

Miss E. F. Dilbeck, Senior Executive, British Iron & Steel Federation.

Mr. A. A. Elliott, Higher Executive Officer, Ministry of Transport & Civil Aviation.

Mr. H. I. W. Gordon, Test House Manager, Colvilles Limited.

Mr. J. H. Gray, Senior Mechanical Designer Draughtsman, W. H. Allen, Sons & Co. Ltd.

Mr. M. A. Mir Itly, Clerk, East African Railways & Harbours.

Mr. J. Phillips, Chief Training Officer, Organisation & Service Division, Ministry of Transport & Civil Aviation.

Mr. J. L. Ransome, Development Engineer, Birmingham & Midland Motor Omnibus Co. Ltd.

Mr. G. C. Stevens, Assistant (Productivity & Planning), Waterloo, Southern Region, British Railways.

Mr. S. Stevens, District Engineer, Paddington, Western Region, British Railways.

M.B.E. (Honorary)

Mr. G. S. Rajaiah, lately Assistant Traffic Superintendent, Malayan Railways.

B.E.M.

Mr. M. Aslam, Stationmaster, Toroto, East African Railways & Harbours Administration.

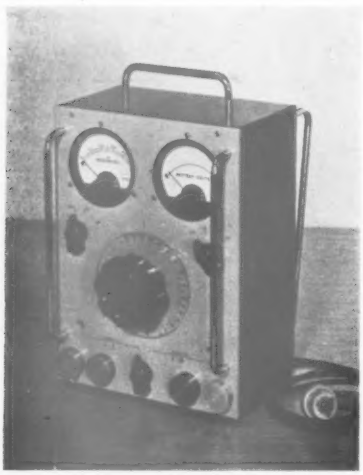
Mr. W. E. Nock, Yardmaster, Frodingham, Eastern Region, British Railways.

Mr. W. H. Weston, Bridge Inspector, Western Region, British Railways.

NEW EQUIPMENT AND PROCESSES

Portable Metal Sorter and Resistivity Measurer

THE sorting and identification of non-ferrous metals and alloys is facilitated by a portable, lightweight, battery-operated instrument which is easy to read and operate. The basic design of the metal sorter and resistivity test set, Type MM 611, production of which has now commenced, originated from the British Aluminium Co. Ltd., a large manufacturer of light alloys, and is stated to be an essentially practical instrument which can



be used by anyone with little or no electrical or electronic knowledge.

The instrument is operated by dry batteries and can be used anywhere where there is no electricity supply, for example, in works stockyards. The portable test set consists of an investigating head on a lead, which is plugged into a small instrument case. The test heads are interchangeable and designed to ensure that changes of ambient temperature do not cause inaccuracies.

The head is placed on the metal surface, which need not, necessarily, be flat, since the measurement of the resistivity of a metal is not critically dependent on the spacing of the head from the surface of the metal under investigation. Identification is based upon the specific resistivity of the particular metal. Because this is a physical constant of which every metal and alloy has its own specific value, its measurement gives a figure which identifies the metal being tested.

When the test head is brought near to the metal, its inductance changes. The oscillator in the instrument case ceases to move. The calibrated dial is rotated until the oscillator comes into action again. This point is indicated by the left-hand meter, and the reading of the calibrated dial at this point is the specific resistivity of the metal in micro-ohms per cu. cm. Provided the metal or alloy has a specific resistivity between 1·0 to 28·0 micro-ohms per cu. cm., it may be measured, and the metal or metals distinguished or sorted.

Four metal standards are provided below the calibrated dial, by means of which the instrument's calibration may be checked and the necessary correction is made by the calibration control on the panel. A four-position switch and meter enables the high tension, low tension and bias batteries to be tested when required and affording instant calibration adjustment and battery tests to be made in a few seconds. Batteries should be replaced when the battery test meter reads below the reject mark. Battery compensation is always in operation. It is entirely automatic and ensures maximum battery life and complete stability of operation.

The uses of this tester include the sorting of metals and alloys, the detection of the clad side of rod, sheet, tube and bar, whether as a raw material or partly or fully fabricated, detection of local variations in hardness, of surface flaws, and of embedded foreign matter.

Dimensions are 9½ in. × 7 in. × 4 in., and the test set weighs 3 lb. including batteries.

The price, ex works in U.K.: £95. The manufacturer is the Solartron Electronic Group Limited, Thames Ditton, Surrey.

Heavy Duty Welding Manipulator

DESIGNED for medium and heavy welding processes—as for instance, fabrication of axleboxes, bogies and headstocks—the Metrovick power-operated welding manipulator which, while nominally of 6-ton capacity, accomodates a maximum load varying from 4 to 8 tons depending on the centre of gravity of load above the table, and the off-set of the load from the centre of table. The table, shown in the illustration below, is 94-in. dia.

The machine is of fabricated steel construction with the table designed for either constant or variable speed rotation, and for tilting, up to an angle of 135 deg. Both motions are imparted to the table by means of a motor-driven worm and wheel gearing, with both automatic braking and locking mechanisms. Two high-torque, squirrel-cage motors are fitted on the machine with constant speed rotation.

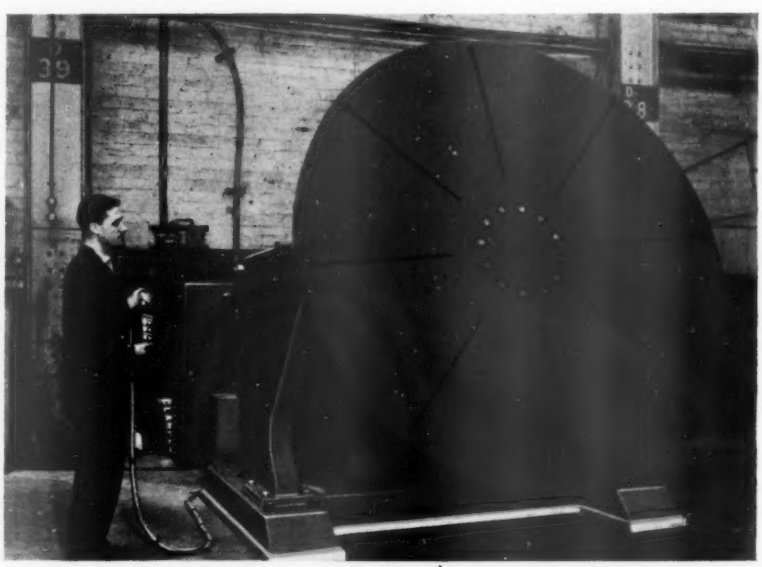
If variable speed is required one of these motors is replaced by a variable speed motor with electronic control giving a speed range 20-1. The design facilitates easy conversion from one type of motor to the other. Control of the motor is effected from a remote push button station, complete with inter-connections in a 20-ft. length of flexible conduit. The height above floor with the table horizontal is 66½ in., and the total weight is 3¾ tons. Constant speed rotation is 0·77 r.p.m., and variable speed from 0·513 to 0·0256 r.p.m.

The manipulators are being built to special order. The manufacturer is the Metropolitan-Vickers Electrical Co. Ltd., Trafford Park, Manchester.

Simplified Transistor Tester

TO cater specifically for instances where complete and detailed information about the parameters of junction transistors, used in carrier frequency telecommunications, is not needed, but only an indication of their general characteristics and condition, a simplified transistor tester, Type L.264, has been produced which, it is claimed, is as easy to use as a conventional valve tester. The L.264 affords a ready means of checking three of the more important junction transistor parameters; base-collector short circuit current gain, d.c. collector current for zero base current, and collector turnover voltage. All measurements are presented as direct meter readings.

To maintain the simplicity of the instrument, the base-collector s/c current gain is measured at d.c., advantage being taken of the approximately linear relationship between collector current and base current, which permits finite changes of current to be used to measure this para-



meter with an accuracy high enough for all practical purposes. Measurement is thus reduced to observing the collector current produced by a convenient known base current, and transcribing it into a direct meter reading of base-collector current gain. The standing current is backed-off in the collector current meter. The range is 0-100, with ± 5 per cent accuracy.

Since the d.c. collector current for zero base current is sensibly independent of collector voltage, direct metering of this parameter can be made. A controllable collector supply voltage (0-20 v.) is provided. The range here is 0-2·5A, covered in six ranges, also with an accuracy of ± 5 per cent.

With the collector turnover voltage, the transistor tester measures the collector-emitter turnover voltage for zero base current. A relatively high voltage is applied to the collector via a resistance, and the turnover voltage is read directly from the meter. Facilities are incorporated to vary the feed resistance and collector supply voltage to give three ranges of collector dissipation: 2·5, 25 and 205 mW. The collector voltage range for the tester is 0-20V. metered, and the collector current range is 0-2·5A metered. The turn-

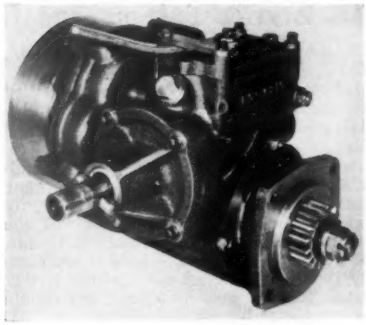
over voltage range is dependent on permissible collector dissipation of transistor: 0-18V. on 2·5 mW. range; 0-85V. on 25 and 250 mW. ranges, and the mains input is 200-250V., 40-60 c/c single phase, consumption is 10 vA. The dimensions are: height 7 in., width 17¼ in., and depth (front to back) 12⅛ in. The weight is 20 lb.

The price of the tester is £78. Delivery is about four weeks. The manufacturer is Mullard Limited, London, W.C.1.

Manual Inertia Starter for Diesel Engines

DIESEL engines can be started by hand with a minimum of effort when using the Simms-Instart manual inertia starter. It is claimed that an average man can start an engine after cranking at a moderate speed for about 10 sec., thus obviating the need for battery or other electrical equipment such as a dynamo and charging control unit. The starter can be fitted in place of a standard electric starter without any modification to the engine, which it turns by the pinion engaging the flywheel gear-ring in the normal way.

Cranking the starter handle engages the pinion with the flywheel gear-ring, turning the engine slowly via auxiliary gears in the starter, thus freeing the engine and priming the injector system. When the rotating mass of the starter has reached the appropriate speed, a warning bell sounds in the starter and the operator then moves



over a small lever which engages the inertia mass with the pinion through reduction gearing and turns the engine smartly. When the engine fires, the pinion automatically disengages from the engine flywheel.

It is thought that in those instances where the installation or maintenance of electrical equipment is unnecessary or undesirable, such as stand-by generating sets, tractors and industrial engines, the manually operated inertia starter would find an application.

It is stated that prototypes of the units are available as samples to interested parties although full-scale production is not anticipated until six months' time.

The manufacturer is Simms Motor Units, Oak Lane, East Finchley, N.2. As far as the price of the units is concerned, each application is being treated on its merits at present.

Low-Viscosity Oil Conditioner

AN addition to the range of Bowser Industrial Equipment now being manufactured is the Figure 832 Oil Conditioner. This unit, which is suitable for diesel running sheds, and road depots, is designed to condition low viscosity, high-demulsibility oils containing dirt and other foreign matter, to remove water, either emulsified or "free," and is useful for such oils requiring acid correction. At the moment, it is made in one size only, with a capacity of 45/90 gal. per hour, but will subsequently be available with capacities up to 1,080 gal. per hour.

With the Figure 832, oil is not merely filtered but truly reconditioned—making it highly resistant to sludging and acid formation, permitting the oil to efficiently perform indefinitely. Power consumption

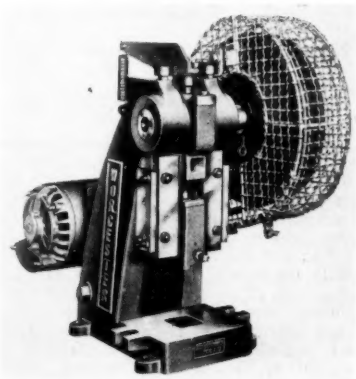
is negligible and there is no wear, or other high operating or maintenance expense. Careful design enables all the essential processes to be performed in a single unit. Approximate overall dimensions are: height 4 ft. 8 in., width 3 ft. 8 in., and depth 3 ft. 1 in.

High efficiency and economy are claimed due to the incorporation of advanced principles of precipitation, acid correction, dehydration and filtration, with simplicity of operation, which is automatic after starting. Easily removable vertical filter and dehydrating units, accessible cleanout connections and removable cover lids allow easy cleaning and accessibility.

The price is expected to be approximately £800 and delivery to be 10 weeks. The manufacturer is Liquid Systems Limited, Union Road, Croydon, Surrey.

Two-Ton Motorised Bench Power Press

THE two-ton nominal capacity Worcester Type C bench power press, with optional fixed strokes of ⅞ in. or ½ in., and a ram adjustment of ¾ in., is suitable for



punching and shearing small pieces. Overall dimensions of the press are: height, width and depth 1 ft. 10 in., 1 ft. 2 in., and 1 ft. 9 in. respectively. Bed size is 7 in. × 5⅛ in. and open tool height 4⅛ in. A ½ h.p. motor is required to drive the machine, which weighs 1 cwt. 3 qtrs. (nett), and optional extras include a floor stand, clutch mechanism for single stroke operation, and an extension shaft for automatic feed drive.

The price is £86 12s. 6d. Delivery is three weeks. The manufacturer is Jones & Attwood Limited, Stourbridge, Worcestershire.

Automatic Welding Process

THE production of horizontal-vertical fillet welds on stiffeners with an open arc process is now possible, it is stated, with the Fusarc/CO_2 automatic welding-process. The electrode consists of the Fusarc patented type of continuous covered electrode, with a newly developed type of covering, and this is used in conjunction with a carbon dioxide gas shield.

Fusarc/CO_2 No. 1 is a general purpose electrode for horizontal-vertical fillet welding, single and multipass butt welding, and for fillet welding in the flat position. It is approved both by Lloyd's Register of Shipping, and the Ministry of Transport.

The process, for which patents have been applied, has been evolved by Quasi Arc Limited, of Bilston, Staffs.

Electric Train Service to Southend Inaugurated

Completion of £2,500,000 scheme : new all-steel multiple-unit rolling stock : 119 trains daily compared with 64 formerly

The extension of electrification in the Eastern Region of British Railways from Shenfield to Southend-on-Sea Victoria has now been completed, and a formal opening ceremony was held on December 28, 1956, when the Mayor of Southend drove a train carrying the official party into Southend Victoria station. With the extension of electrification earlier in 1956 to Chelmsford and now to Southend-on-Sea Victoria more than 30 miles of route have been added to the electrified lines of the Eastern Region.

Through electric train services between Southend-on-Sea Victoria and Liverpool Street came into operation on December 31, 1956, marking the completion of the Eastern Region £2,500,000 electrification scheme for the Shenfield-Southend-on-Sea Victoria-Chelmsford lines. The extension to Chelmsford was opened on June 11, 1956. The electrification to Southend-on-Sea Victoria, like that to Chelmsford, is an extension of the Liverpool Street-Shenfield system which was completed in 1949. The whole of this electrification operates on the 1,500-V. d.c. overhead system, but provision has been made to convert to the new high voltage a.c. system recently adopted by British Railways.

New Rolling Stock

The specially designed all-steel rolling stock which operates the new services, made up into four-coach units with first and second class accommodation, earned favourable comment on the inaugural trip from Southend to Shenfield and back. The special electric train, with some 175 guests on board, left Southend at 11.15 a.m. The rapid acceleration and smooth running were compared favourably with the performance of the steam train which had brought many of the party from London earlier in the morning, taking 90 min. for the journey. On the return trip from Shenfield, Mr. H. H. Smith, Mayor of Southend, took the controls and brought the train into Southend.

At lunch at the Palace Hotel, Southend-on-Sea, Sir Reginald Wilson, Chairman, Eastern Area Board, said that early in the year, when the performance of the services during the bad weather had come under heavy fire, four things were promised for 1956; that electrification of the former Great Eastern line into Southend would be completed by the end of the year; that a real start would be made on electrifying the London, Tilbury and Southend line; that a decentralisation of organisation would be brought about; and that a special effort would be made to improve public relations. All those promises had been kept.

He did not claim that the Great Eastern electrification was in itself a vast achievement, but it had a special significance. "Electrification has at last come to Southend, and the event deserves a little celebration. We wish, also," he said, "by this celebration to pay tribute to the skill and energy of all those who conceived, planned, carried out and completed the project. It says much for the efficiency and hard work, both of our own people and of the contractors' people, that the job was virtually completed a month ahead of schedule."

In another sense, however, the work was 50 years late. Already in 1901 there was a Bill in Parliament for an electrified line out from London through the north-eastern suburbs. The plan was defeated—the story of the steam locomotive *Decapod*, built to do all that electric traction could do, was well known—and the steam services survived. Only as from December 31, 1956, would there be services running on the line which were modern and clean, reasonably frequent, and reasonably fast. The daily number of trains would be almost doubled, and they would be, on average, 15-20 per cent faster.

Sir Reginald Wilson, Chairman, Eastern Area Board, about to board the inaugural train at Southend with the Mayor and Mayoress of Southend. Holding the door is Mr. F. Winters, the stationmaster

Though it might please many Southenders to have more non-stop trains to Liverpool Street, intermediate passengers would take a different view. If receipts at all stations to Shenfield were totalled, receipts at Southend Victoria would be less than one-seventh of that total. The other six-sevenths must be served; the railways were equally the servants of all.

L.T.S. Electrification

Southend would get a second turn, Sir Reginald Wilson explained, with the electrification of the London, Tilbury & Southend route. Their second promise had been to make a serious start on this, and travellers to Fenchurch Street could already observe great works going forward. This might lend them patience to put up with the difficulties of the period ahead. Passengers who wanted a less passive role could assist by rebutting some of the current propaganda against the railway modernisation plan. He presumed that the suggestion about turning all railways into roads had died a natural death, but there was still the whisper that the country could not afford the plan. Every year 40 times the sum required for the betterment of the railways was spent on tobacco and alcohol. During the last 10 years, only a fraction of the expenditure on new road vehicles had been spent on railway vehicles, and even under the modernisation plan the railway track would get only £7,000,000 a year—only a fraction of the road programme announced by the Government. The scheme for decentralised traffic management was already complete on the former Great Eastern, and was actually in operation on the L.T.S. in new premises near Fenchurch Street. As to public relations, there, as in private relations, two parties were needed for a quarrel, and two for friendship. There was a long and unhappy history, stretching back a hundred years, in the public relations of railways, but they were doing their best to create a happier situation. The railwayman had a great tradition of service, and his master the customer had no wish to be either unfair or petty.

In a short reply, the Mayor of Southend complimented British Railways and the contractors on the early completion of the work. He hoped that passengers would not misuse the new trains. It was to be hoped, he said, that work on the L.T.S. line would be pressed ahead. Great things had been achieved in the Eastern Area and he looked forward to even more.

Many of the party returned to London in an electric train which, despite several stops, covered the 41¾ miles in just under 55 min.

The guests included:—

Civic Guests:

Mr. H. Ashton, M.P. (Chelmsford); Mr. B. R. Braine, M.P. (Essex, S.E.); Mr. S. J. McAdden, M.P. (Southend E.); Alderman and Mrs. H. H. Smith, Mayor and Mayoress of Southend; Chairmen of Urban District, Rural District, and Parish Councils along the route and the Clerks to those Councils;

Members, Eastern Area Board:

Mr. Jack Tanner, Mr. A. F. Pegler, Mr. Henry Willink.

British Railways Central Staff:

Mr. E. G. Brentnall, Assistant Signal Engineering Officer; Mr. J. R. Pike, Chief Com-

mercial Officer; Mr. C. W. King, Chief Civil Engineer; Mr. A. E. Robson, Chief Carriage & Wagon Engineering Officer; Mr. R. F. Harvey, Chief Operating & Motive Power Officer; Mr. J. A. Broughall, Electrical Engineer, Development; Mr. S. B. Warder, Chief Electrical Engineer.

British Railways, Eastern Region:

Mr. A. J. White, Assistant General Manager; Mr. H. C. Johnson, Assistant General Manager, Traffic; Mr. M. R. Bonavia, Principal Officer (Modernisation); Mr. A. C. Brinnicombe, Electrical Engineering Dept. (New Works); Mr. K. J. Cook, Chief Mechanical & Electrical Engineer; Mr. P. R. Dashwood, Assistant Estate & Rating Surveyor; Mr. J. W. Dedman, Traffic Manager, L.T. & S. Line; Mr. G. F. Fiennes, Operating Superintendent; Mr. H. W. Few, Assistant Operating Superintendent; Mr. H. R. Gomersall, Planning Assistant to General Manager; Mr. R. A. Green, Signal Engineer; Mr. J. W. Grieve, Assistant Electrical Engineer (New Works); Mr. L. James, Chief of Police (Eastern Area), B.T.C.; Mr. B. X. Jessop, Commercial Manager; Lt.-Colonel G. A. B. Leishman, Electric Traction Engineer, London Area, Eastern and London Midland Regions; Mr. M. B. Macrae, Assistant Engineer (Modernisation); Mr. N. Newsome, Divisional Outdoor Carriage & Wagon Engineer; Mr. G. S. Pillans, Electrical Engineering Dept. (New Works); Mr. H. H. Powell, Regional Architect; Mr. L. Reeves, Carriage & Wagon Engineer; Mr. R. E. Sadler, Assistant Engineer (Modernisation); Mr. A. K. Terris, Chief Civil Engineer; Mr. M. B. Thomas, Public Relations & Publicity Officer; Mr. E. D. Trask, Motive Power Superintendent; Mr. J. Bonham Carter, Assistant to Operating Superintendent (Development); Mr. N. Howard, Electrical Engineer (New Works).

Contractors and other guests:

Messrs. O. J. Crompton, O. W. Minshull, T. H. Rosbotham, and H. H. Storey, British Insulated Callender's Construction Co. Ltd.; Mr. G. A. Ashton, British Thomson-Houston Co. Ltd.; Mr. F. A. Manley, Manager, Traction Division, General Electric Co. Ltd.; Mr. J. Kelly, Wellerman Bros. Ltd.; Mr. F. H. Burnell, W. & C. French Limited; Mr. E. Hosking, Hosking & Son (Essex) Ltd.; Messrs. F. L. Castle and J. Sulston, Siemens & General Electric Railway Signal Co. Ltd.; Messrs. L. F. Capeling and P. Charlton, W. T. Henley's Telegraph Works; Mr. E. A. Mumby, Engineer-in-Charge, Essex County Council; Mr. J. S. Gavin, Chairman, and Mr. L. E. Richards, General Manager, Eastern National Omnibus Co. Ltd.; Mr. C. T. Melling, Chairman, Eastern Electricity Board; Brigadier C. A. Langley, Railway Inspectorate, Ministry of Transport & Civil Aviation; Mr. H. E. Osborn, Chief Accountant & Financial Adviser, B.T.C.

U.T.A. Charges Increase

The passenger and freight charges of the Ulster Transport Authority have been increased by 10 per cent as from December 31. The Northern Ireland Transport Tribunal gave permission for the increase after hearing the application of the U.T.A. presented by Mr. Cyril Nicholson, Q.C. The Tribunal, while rejecting a U.T.A. application for a further 10 per cent increase grant to be held as a "cushion" authorised instead an increase of 5 per cent to be held in reserve.

Mr. Nicholson, for the Authority, agreed to submit a further examination of rates and fares, as soon as the recently enforced increase in petrol and oil tax, arising out of the closure of the Suez Canal, is abolished.

London Transport in 1957

In the January, 1957, issue of *London Transport Magazine*, Sir John Elliot, chairman of London Transport, in a New Year message to the staff, recalls that at the beginning of 1956 he pointed out that London Transport had only one job to do, "to carry the public, to please the public, and to earn our keep." "I said," he continues, "quite bluntly, to those few men and women in London Transport who 'dodged the column,' that for everyone's sake they should go and work somewhere else.

"This year, on behalf of my colleagues on the Executive and the officers in charge of the various departments, I want to say a sincere 'thank you' to the staff, in every department of our road and rail services, for the improved service we are now giving. As a result we have got nearer to the old prewar efficiency and happy relationship with the public, and our road services, as anyone can see, have been running better throughout the year. None the less, there is still plenty of room for improvement, as I know by the letters I receive from the public and from Members of Parliament.

Railway Traffic

"Our railways have again carried more traffic, mainly owing to diversions from the congested roads in the central area, and they have done this very well. Our road staffs have had to put up with this congestion, but with more staff, I am glad to say, and they have once again carried the heaviest urban road passenger traffic in the world—a job to be proud of.

"Last year we almost paid our way, and in 1957 we must do all we can to meet our expenses out of income. There are some 'crackpots' who think that London Transport should provide a service out of all relation to the cost of providing it and that the tax-payer, even if he never uses our services, should foot the bill, while there are others who think that every single route should pay its way regardless of any hardship caused to the public. It has always been our job to hold the balance between these two extremes."

London Transport, he submits, is a non-profit-making undertaking, taking "profit" in its generally accepted sense. Yet it must take enough to cover the full cost of providing the service, which must include depreciation and renewals, adequate maintenance, staff welfare, and interest on the £150 million of capital invested in the undertaking. Some parts of the system, he explains, do not pay their way and "have to be carried on the broad back of the paying services. This is one of the main justifications for a monopoly."

Service to the Public

In looking forward to 1957, he reminds the staff that Lord Ashfield once said: "The day that we are satisfied with ourselves is the day we ought to retire from public service." "Once again," he says, "I would remind you all that the public must be our main consideration. Think of them and help them, everywhere and at all times. They are the people who pay our salaries and wages. They are entitled to our very best endeavours and especially in these difficult times when more and more people are looking to London Transport to carry them to and from their work and leisure due to petrol restrictions. Do not let us fail them!"

C.P.R. FIREMEN'S STRIKE.—It was reported as we went to press that the proposed strike by firemen of the Canadian Pacific Railway would begin at 4 p.m. on January 2. The dispute concerns the company's proposals to reduce gradually the number of firemen employed in diesel locomotive operations in freight and goods yards. On December 31 both sides stated that they were prepared to accept a formula to defer the strike on this issue, but questions about wages arose.

Presentation to Mr. H. H. Phillips

Mr. K. W. C. Grand, General Manager, Western Region; Mr. R. F. Hanks, Chairman, Western Area Board; Mrs. Phillips; and Mr. H. H. Phillips, Assistant General Manager, at the presentation by Mr. Grand to Mr. Phillips on his retirement

U.I.C. Annual Meetings

The Board of Management of the International Union of Railways (U.I.C.) last month held its 42nd and 43rd meetings, and the General Assembly its 14th meeting, at the headquarters of the Union in Paris.

The purpose of the annual meeting is to review the work carried out during the year by the Union Committee and to receive reports from its various offices, including the Office for Research & Experiments (O.R.E.), the Information Centre of European Railways (C.I.C.E.), the Brussels Central Clearing House (B.C.C.), the Bureau of Railway Documentation (B.D.C.), and the International Union of Railway Medical Services (U.I.M.C.). Other matters of special interest before the Board concerned the creation of the financial organisation Eurofima, the commencement, as from next June, of operations by "Trans-Europe Expresses," the progress made by the Europe wagon pool and the activities of the European Passenger Timetable & Through Services Conference, and the Union of European Railway-owned Road Services.

The importance attached to the work of the U.I.C. is shown by the presence at the meeting of the Presidents of General Managers of all the principal European railways and of representatives of the European Goods Train Timetable Conference, the International Carriage and Wagon Unions, and, at Government level, of the Economic Commission for Europe (E.C.E.) and the Central Office for International Railway Transport (O.C.T.I.).

Tribute was paid at the meetings to Signor G. Di Raimondo, former General Manager of the Italian State Railways and a Vice-President of the Union, who has now retired and is succeeded by Signor S. Rissone; to Mr. R. H. Hacker, Chief Continental Officer, B.T.C., President of No. 1 (Passenger Traffic) Committee, who is succeeded in the latter capacity of Mr. G. M. Leach, International Traffic Officer, B.T.C.; and to Mr. Parmantier, Directeur Honoraire of the S.N.C.F., President of the Fifth (Technical) Committee, whose place is taken by Mr. Camille Martin, Directeur du Matériel et de la Traction, S.N.C.F.

On the proposal of Mr. J. C. L. Train, Member of the British Transport Commission and Senior Vice-President of the U.I.C., who led the British delegation, France, in the person of Monsieur Louis Armand, Chairman of the S.N.C.F., was re-elected President of the Union for a further term of two years.

Those who attended the General Assembly included, besides delegates from the principal European railways, representatives from the railways of Algeria, the Belgian Congo, Japan, and Tunisia, also of the Wagons-Lits and Interfrigo Companies. Approval was given by the Assembly, inter alia, to applications for admission, as associate members, of the Belgian Marine and the Zeeland Steamship Company.

The delegates were entertained by the French National Railways to dinner in Paris, at which Monsieur Louis Armand presided; in an inspiring and humourous speech he emphasised the importance, from an international point of view, of the work carried out by the U.I.C.

Mr. J. C. L. Train, leader of the British delegation, was supported by Mr. J. L. Harrington, Chief Shipping & International Services Officer, B.T.C.; Mr. R. H. Hacker, Chief Continental Officer, B.T.C.; Mr. C. E. R. Sherrington, Director of the Research Information Division, B.T.C., and President of the Special U.I.C. Committee for the Exchange of Documentation; Mr. J. W. J. Webb, Regional Accountant, Southern Region; Mr. G. M. Leach, International Traffic Officer, B.T.C.; and Mr. W. B. Addinall, Secretary of the Continental Traffic Committee.

Parliamentary Notes

Building Steam Locomotives

Mr. G. Nabarro (Kidderminster—C.) spoke of the manufacture of steam locomotives when he argued, in the Electricity Bill debate on December 17, against the nationalised electricity authority manufacturing heavy equipment. It was only by having, he said, at the command of the home market an established and continuous demand for the products of their industry that manufacturers could remain highly competitive in price in the export field. He asked the House to consider the case of steam locomotives, which was largely analagous. Since the nationalisation of railways, the steam locomotive manufacturers had had many difficulties. They had been faced with the fact that the railways are cutting down purchases of steam locomotives which had caused the cost of locomotives for export to rise. In many cases this had resulted in the loss of contracts to German competitors. That was also manifest in the case of contracts for open tender put out by the Indian Government and by other foreign Governments. Exactly the same thing might apply if they had in Britain, interposed in this Bill, an additional means of manufacturing heavy electrical equipment by the nationalised authority.

Mr. C. A. Howell (Perry Barr—Lab.) asked whether Mr. Nabarro was suggesting that the B.T.C. had been manufacturing and exporting so many locomotives that the manufacturers could not now export locomotives.

Mr. Nabarro said he did not suggest that for one moment.

Diesel Locomotives

In the debate on the Electricity Bill on December 17, Mr. Geoffrey Lloyd (Sutton Coldfield—C.) said he would like to give an example from the history of another nationalised industry. They had all known for years that the most inefficient way in the world of burning coal was in a steam locomotive. Representations had been made to the B.T.C. for years about it. There had been a stream of technical arguments of the highest authority, showing that in this country, whatever might be the case elsewhere, diesel locomotives were bound to be uneconomic. Then, quite suddenly—with no preparations—an enormous diesel programme was announced. There was no change in coal; the diesel engine had not improved particularly, and the B.T.C. organisation had not been changed. But the men at the top had changed. A new Chairman had come into the Commission and, perhaps more important, some of the high executives—the old brigade of the steam generation—had retired, and younger men had come in to take their places.

Mr. Ernest Popplewell (Newcastle-upon-Tyne W.—Lab.) said Mr. Lloyd must know that the B.T.C. had lacked capital and permission to expend capital for many years. It had been fully aware of the need for dieselisation and electrification all through that period, but it was not until it received the all-clear that it was able to go ahead.

Mr. Lloyd said his purpose was not to attack the B.T.C., but to emphasise the importance of the human factor. If Mr. Popplewell's explanation of this sudden change was the correct one, he could not understand why the B.T.C. did not explain it at the time, instead of giving forth this cloud of technical obscurantism.

Railway Power Stations

In the debate on the Second Reading of the Electricity Bill on December 17, Mr. C. Hobson (Keighley—Lab.) said London Transport had three power stations. He did not know whether there was still one at Wimbledon. He wondered whether the railways were to retain their power stations. It would be tidier to put all generating stations under one authority.

Mr. D. Renton, Parliamentary Secretary to the Ministry of Fuel & Power, replying to Mr. Hobson, said this was a point which could be considered further in Committee. In relation to the general structure of the industry, it was a comparatively minor detail.

Later in the debate, Mr. Hobson said that some 160,000 tons of coal were carried by road to the power stations and asked if this could not be carried by rail or barge.

Mr. G. Nabarro (Kidderminster—C.) said in his constituency, last year 115,000 tons were carried by road. That was only a tiny fraction of the coal carried by road.

Mr. Hobson: That is fantastic, and I hope directions will be given for it to be stopped.

Questions in Parliament

Call-up of Firemen

Mr. S. S. Awbery (Bristol C.—Lab.) asked the Minister of Labour & National Service on December 18 if he was aware of the difficulty experienced in obtaining young men to work as firemen on the railway in the Bristol area; and if he would take steps to exempt these men from military service so that once they started they could continue their service on the railway where they would be required in the event of an emergency.

Mr. Iain Macleod said the Minister of Transport & Civil Aviation announced on December 5 that for the duration of the present emergency the call-up of certain men in key positions on the railways, which included firemen, was to be suspended. There was at present a general shortage of young men for employment, and he was not prepared to grant indefinite deferment to those young men to whom Mr. Awbery referred.

MUREX LIMITED.—The directors of Murex Limited state that since the opening months of the current year there has been a return to more normal trading conditions, and have declared an unchanged interim ordinary dividend of 7½ per cent. Final payment for the year ended April 30, 1956, was 12½ per cent.

BRITISH RAILWAYS CHRISTMAS TRAFFIC.—British Railways have stated that railway passenger traffic during the Christmas holiday was the heaviest for many years. More than 515,000 passengers travelled in 1,473 trains leaving the principal London termini on December 21 and 22 and on Christmas Eve. During the holiday period (the 72 hr. ended 6 a.m. on December 27) over 47,000 wagons of coal were moved, an increase of more than 13,000 wagons compared with the corresponding period of 1955.

Staff & Labour Matters

N.U.R. Wage Claim

The N.U.R. has rejected the B.T.C. offer to improve the rates of pay of conciliation staff employed on British Railways by 3 per cent, and has asked that the claim should be referred to the next stage of the negotiating machinery, which is the Railway Staff National Council on which representatives of the Commission and the three railway trade unions sit.

The Commission offer is in line with the decision of the Railway Staff National Tribunal on the claim of the A.S.L.E.F. for a 15 per cent increase in the rates of pay of footplate staff. This decision has not yet been accepted by the A.S.L.E.F. and will be considered at a delegate conference of the Society's representatives. The claim of the N.U.R. is for an increase of 10 per cent.

London Busmen's Claim

After prolonged discussions on December 31, 1956, between representatives of the London Transport Executive and the Transport & General Workers Union, no agreement was reached in connection with the union claim for an increase of £1 a week for busmen employed on London Transport. The approximate cost of the claim if granted in full would be £3,000,000 per year.

Contracts and Tenders

An order from Sudan Railways for 400 30-ton all-steel bogie covered wagons has been received by Metropolitan-Cammell Carriage & Wagon Co. Ltd. Some 600 wagons of this type have been supplied by Metropolitan-Cammell in the last few years. The present order, valued at more than £750,000, was secured in the face of keen European competition.

A contract has been awarded to the English Electric Co. Ltd. for the supply of seven 750-h.p. diesel-electric locomotives to the Midland Railway of Western Australia. The diesel motors and electrical equipment will be built at the company's Preston works, and the mechanical parts at the Rocklea works in Australia.

The British Transport Commission has placed a contract with Charles Roberts & Co. Ltd. for 38 railway tank wagons to be used for carrying creosote oil to British Railways creosote depots throughout the country. Each tank will have a capacity of 4,430 gal. The wagons will be built with a 15-ft. wheelbase and will be equipped with vacuum brakes and roller bearings to enable them to run at the high speeds demanded under the modernisation plan.

British Railways, North Eastern Region, have placed the following contracts:—

E. Dixon Barker & Sons Ltd., West Hartlepool: installation of electric lighting, Normanton Motive Power Depot

W. E. Hargrave Ltd., York: hot water installation, York Headquarters Offices

Wright Anderson & Co. Ltd., Gateshead: supply of steelwork for bridges No. 281 and No. 1, Boldon Colliery station

S. H. Heywood & Co. Ltd., Manchester: electric lighting, Wakefield grain warehouse.

The Special Register Information Service, Export Services Branch, Board of Trade, reports a call from India for heel bolts as follows:—

1. 166 cwt. heel bolts 9 in. × 1 in. with castle-head nuts and split pins to CE. KDC. Drg. No. 90/22-1 (ISD No. 12597) and to IRS Specn. No. T-10-54 with Corr. No. 1 of 8/54

2. 66 cwt. bolts M.S. sqr. head 12 in. × ½ in. with hex. nuts but without washers to CE. KDC. Drg. No. 12659/1 (D.G.S. & D.N. 6550 to BSS. 916 and Class II steel

3. 1,800 No. stud bolts to prevent lifting of tongue, 1 in. × 8⅞ in., complete with hex. nuts, washers, and split pins to CE. KDC. Drg. No. 8954/1 (D.G.I. & S. No. 4908) and to IRS Specn. No. T-10/54 with Corr. No. 1 of 8/54

4. 2,418 cwt. fishbolts with Ibotson nuts 90 BS and 85 BN 6¾ in. × 1 1/16 in. to CE. KDC Drg. No. 10176 type A1 (ISD No. 12751)

5. 1,271 cwt. as item 4, but 4⅜ in. × 1 1/16 in. type A2

6. 188 cwt. bolts with nuts for MSM type BG rails Auchers for all rail sections to CE. KDC. Drg. No. 11878. Alt. 1 (D.S.I. & S. No. 417) and to Specn. given on Drg.

The issuing authority is the Director General of Supplies and Disposals. Tender No. SR2/Heel Bolts/IV/A. Bids should be sent to the Director General of Supplies & Disposals, Shahjahan Road, New Delhi. The closing date is January 10, 1957. A set of tender documents is available for loan to United Kingdom firms in order of receipt of applications by the Branch (Lacon House, Theobalds Road, W.C.1). A photo-copy set can be purchased from the Branch for 13s. Cheques and postal orders should be made payable to the Principal Accountant, Board of Trade. Firms wishing to collect photo-copy sets of tender documents are advised to notify their requirements in advance. Local representation is essential. The reference ESB/31589/56 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, has received a call from India for mechanical railway signalling equipment as follows:—

800 foundation lead off to EIR Drg. No. P.3528 (I.S.D. No. 7136) and cast-iron to I.S.S. I.S.210 grade 10C

867 rod connection 1¼ in. (SA) to EIR Drg. No. A.3246, alt. 1 (I.S.D. No. 7128/1) complete with all parts shown on the drawing and to I.R.S. specn. S-10/56

867 rod bar driving 1¼ in. (SA) to EIR Drg. No. A.3244, alt. 1 (I.S.D. No. 7127/1) complete with all parts shown on the drawing and to I.R.S. specn. No. S-10/56

The issuing authority is the Director General of Supplies and Disposals. Tender No. is SRIA/18556-G/V/B.

Bids should be sent to the Director General of Supplies and Disposals, Shahjahan Road, New Delhi. The closing date is January 15, 1957. A set of tender documents with drawings is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1). The reference ESB/32141/56 should be quoted in any correspondence with the Branch.

The Special Register Information Service, Export Services Branch, Board of Trade, has received the following call from India for mechanical railway signalling equipment as follows:—

191 three-lever slot, type "B," complete with all parts as shown on the drawing, I.R.S. Drg. No. SA 2142 alt. Nil, to I.R.S. specn. No. S-10-56 and C.I. to I.S.I. specn. 210 (grade 12 for bracket grade 10c for counterweight).

1,634 signal lamps (removable type) complete with the following:—to I.R.S. Drg. No. SA 5701 and I.R.S. specn. No. S-10-56

(1) optical lenses 5⅜ in. dia. with 3½ in. focus

(2) fount with burner to I.R.S. Drg. No. S.A.-5766 on (SA-5761-SA 5766) alt. 7; I.R.S. specn. No. S-10-56

The issuing authority is the Director General of Supplies and Disposals, Tender No. is SRIA/18447-G/V(C).

Bids should be sent to the Director General of Supplies and Disposals, Shahjahan Road, New Delhi. The closing date is January 15, 1957.

A set of tender documents is available for loan to United Kingdom firms on application to the Branch (Lacon House, Theobalds Road, W.C.1). A photo-copy set can be purchased from the Branch for 16s. Cheques and Postal Orders should be made payable to the Principal Accountant, Board of Trade. Firms wishing to collect photo-copy sets of tender documents are advised to notify the Branch in advance of their requirements. The reference ESB/32079/56 should be quoted in any correspondence with the Branch.

Notes and News

Production Engineer Required.—A production engineer is required for railway rolling stock manufacturers. See Official Notices on page 32.

Permanent Way Inspector Required.—A permanent way inspector, between 35 and 40 years of age, is required by a mining company in West Africa, for privately owned railway. See Official Notices on page 32.

Engineering Assistant Required.—Applications are invited for the post of engineering assistant required by London Transport, to carry out design of junction work and re-alignment of track on London Transport's railway system. See Official Notices on page 32.

Vacancy for Engineering Assistant.—London Transport requires an engineering assistant for duties concerned with special investigations to improve maintenance methods and reduce failures and delays, and to take charge of operations on the track. See Official Notices on page 32.

Special Trains for Fogbound Air Travellers.—To cater for airline passengers diverted to Prestwick Airport because of fog in England, the Scottish Region shortly before Christmas arranged special overnight trains to London from Glasgow and Kilmarnock, also extra coaches attached recently to Glasgow-London night trains. For outward-bound air passengers a special refreshment car train was run from London direct to Prestwick Station.

B.R.S. in Miniature at Schoolboys' Own Exhibition.—At the Schoolboys' Own Exhibition, which opened at the Royal Horticultural Hall, London, on December 31, visitors can see British Road Services at work in miniature. The main feature on

the stand takes the form of a model panoramic scene. Running through this are two roads along which will move scale models of a wide variety of vehicles in daily use by B.R.S. The vehicles represented include those used on general haulage, parcels and smalls, household removals, heavy haulage, and contract hire services. Shown apart from the main feature is a model of a steam traction engine which was used by Pickfords between 1927 and 1943. A B.R.S. driver is in attendance on the stand.

End of Transport Levy.—The Ministry of Transport & Civil Aviation announces that the Transport Levy on goods road vehicles, which was imposed under the Transport Act, 1953, came to an end on December 31, 1956.

New G.N.R.(I.) Halt near Dublin.—The Great Northern Railway Board is to open a halt in the Dublin suburban area a few miles from Amiens Street on the main line. Known as Harmonstown Halt, it will serve the housing estates between Killester and Raheny Halts. The journey time between Harmonstown and Dublin Amiens Street will be about 9 min., and more than 25 trains each way daily will stop there.

Midland Red Bus Fares Raised.—The Birmingham & Midland Motor Omnibus Company (Midland Red) have made temporary fares increases of ½d. and 1d. to meet the rise in the cost of fuel. The increases came into effect on December 29, jointly with those recently authorised by the West Midland traffic commissioners. Wilts and Dorset Motor Services have also raised fares ½d. on short journeys and 1d. on longer journeys from December 30.

B.T.C. and Southern Area Board Visit to Eastleigh.—The accompanying illustration shows members of the party which recently visited the Southern Region Carriage & Wagon Works at Eastleigh (right to left): Messrs. F. J. Pepper, Carriage & Wagon Engineer, Eastleigh; J. C. L. Train, Member of the British Transport Commission; R. C. Bond, Chief Mechanical Engineer, B.T.C.; C. P. Hopkins, General Manager, Southern Region; Sir Philip Warter, Chairman, Southern Area Board; Messrs. W. J. A. Sykes, Chief Mechanical & Electrical Engineer, Southern Region; S. B. Warder, Chief Electrical Engineer, B.T.C.; H. S. Smyth, Electrical Engineer, Southern Region.

B.R.S. Chairman's Message to Staff.—In a Christmas message to the staff, Major-General G. N. Russell, Chairman of British Road Services, states that the fact cannot be disguised that 1957, with its prospect of fuel shortages, will bring its difficulties. "But," he says, "we have been through difficult times before and have succeeded in making the best of our handicaps." B.R.S. emerged from the difficult and trying period of disposals with a reputation which had never stood higher and they had been looking forward to 1957 with high hopes. Whatever the New Year may hold, he declares, "we can at least pledge ourselves to make the most of such opportunities as may come our way and to do our best to serve trade and industry."

Tourist Prospects for 1957.—Proposed new arrangements for incoming and outgoing travellers were announced this week by Thos. Cook & Son Ltd. It is reported that political crises and petrol rationing are not seriously affecting bookings, which are already being received in encouraging numbers. Every effort is being made to keep down costs, and though slight increases appear in some cases there is a 10 per cent reduction in others. More special planes have been chartered and air and other more general services increased. More Continental resorts are covered. A new train—"The Italian"—is available which offers through carriages from the French port to the Adriatic and Ligurian coasts. More couchettes are available on special trains. At home, the high-season charges barrier has not yet been broken down, but repeat bookings are well up to expectations. A widening of the present arrangements made in conjunction with the C.T.A.C. and British Railways under which holidays are arranged to Scotland and the Isle of Man includes the inauguration of special all-in holidays in Ireland from various main population centres in England and Wales. Of particular value is an eight-day holiday to Jersey from London at £19 2s.

Members and officers of the British Transport Commission, the Southern Area Board, and the Southern Region on a visit to Eastleigh Carriage & Wagon Works

Electrification in Czechoslovakia.—The recently electrified sections between Prague and Ceska Trebova and between Zilina and Spisska Nova Ves are operated at 3,000 V., and not at 1,500 V., as stated in our issue of October 19, 1956. The Czechoslovak Ministry of Transport points out that the Skoda locomotive illustrated on page 461 of that issue is one of a type supplied for both 3,000-V. and 1,500-V. lines. No electrification at 1,500 V. d.c. has been inaugurated in Czechoslovakia since before the last war.

Boy's Escape at Crossing.—A 10-year-old boy was struck by a goods train recently while passing over a crossing at Gedling & Carlton station, Nottinghamshire, recently in thick fog. He was pushed down between the rails by the locomotive and the rest of the train passed over him as he lay on the sleepers. He was taken to the station for treatment as soon as the train had gone by and was later sent to Nottingham Children's Hospital suffering from cuts and bruises. His condition the next day was said to be "quite comfortable."

Manchester Export Traffic Depot.—The opening on January 7 of a depot at Manchester Liverpool Road, London Midland Region, for small consignments for export is consequent on the success of the three depots opened recently at Birmingham, Leicester, and Longport. The scheme for small consignments for export, for which British Railways make no extra charge, includes the collection by the railway by a special cartage service, and sorting of consignments at depots into through wagonloads to the ship side or docks.

Revised Fares for Dogs on London Underground.—A new scale of charges for dogs, taken by passengers on the Underground, was introduced by London Transport on January 1. Previously on the Underground only single tickets had been issued to passengers for their dogs, but the revised charges provide return tickets. In some cases the new charges will show reductions on present fares and increases on others. Where the ordinary single passenger fare is not more than 6d. the charge for a dog is 2d. single and 3d. return; where the ordinary single fare is over 6d. and up to a shilling the dog rates are 5d. single and 8d. return and so on. The new scale has removed most of the anomalies at present existing in the charges for dogs carried to stations on the Harrow and Aylesbury section of the Metropolitan Line and to British Railways stations where the journey starts at a London Transport station.

To the Circus by the Southern Region.—A record number of parties have been arranged by the Southern Region to travel to Bertram Mills Circus at Olympia. From January 1 nearly 40 special trains are taking more than 12,000 children and 5,000 adults from Kent and East Sussex. On some of these trains the locomotives carry a specially decorated headboard, and on the homeward journey Father Christmas distributes both toys and refreshments. Two of the largest parties arranged are those from the British Petroleum (Isle of Grain) Refinery last Tuesday, with three special trains convey-

ing 1,200 children and 150 parents, and today (Friday), when 2,800 children and 200 adults travel to Olympia in five special trains from Reeds Aylesford Paper Mills.

English Electric at the Schoolboys' Own Exhibition.—Models of electric and diesel-electric locomotives built by firms of the English Electric Group are on view at the Schoolboys' Own Exhibition, currently being held at the Horticultural Halls, Westminster, until January 12. Amongst other exhibits are two models of the 18-cylinder Deltic engine built by D. Napier & Son Ltd.

Leyland Motors Limited Issue Results.—Leyland Motors Limited announce that in response to the recent offer of 2,487,161 ordinary shares to stockholders 2,288,304 shares were taken up under rights. The remaining shares have been allotted to applicants for excess shares on the following basis: Applications for up to and including 300 shares, in full; for over 300 and up to and including 2,001, 300 shares each; for 2,002 up to and including 10,000, 15 per cent. of the amount applied for; for 10,001 up to and including 24,000, 1,500 each.

Mullard Limited Change of Address.—Mullard Limited announces that correspondence for all departments should now be addressed to Mullard House, Torrington Place, London, W.C.1, consequent upon the removal to new headquarters. The telephone number is Langham 6633.

B.T.C. Commercial Advertising Service New Window Displays.—A new set of window displays in the series illustrating the appeal British Transport Advertising sites have for leading national trades and services has been installed at the London headquarters of the British Transport Commercial Advertising Service at Leicester Square Station. Three windows are devoted to advertisements for soft drinks and three others for biscuits, and the two displays are centred on the slogans: "Biscuit manufacturers" (or "Soft drink manufacturers") reach their markets through British Transport Advertising Sites." Sample products of well-known manufacturers are features of the displays, supplemented by two sets of changing photographs of many biscuit and soft drink advertisements appearing on a range of British Transport Advertising sites all over the country. The names of the firms who use such sites are also shown. The displays were produced by the London Press Exchange Limited and their associate, Publicity Arts Limited (designs, Kenneth Pick; themes, Bethell Jones; photographs, Ronald Adams).

British Railways Record Coal Traffic.—British Railways announce that during the week ended December 16 last they carried a greater tonnage of coal, 3,834,000 tons, than in any week since nationalisation. The previous record was 3,746,000 tons in the week ended December 20, 1953.

New Diesel Services in the Hull Area.—The North Eastern Region is introducing diesel traction in the Hull area on January 7, when a number of the existing steam-operated passenger train services between Hull and Beverley, Hull and Hornsea, Hull and Brough, Hull and Goole, and Hull and Withernsea, will be taken over by lightweight diesel trains.

World Power Conference Sectional Meeting.—Mr. G. B. R. Feilden, Engineering Director, Ruston & Hornsby Limited, is the author of a paper entitled "The Application of Diesel Engines and Gas Turbines to the Needs of Under-developed Countries," one of the British papers to be given at the sectional meeting of the World Power Conference to be held in Belgrade in June.

Incandescent Group Representation.—Mr. M. V. Jackson, Technical Representative of the Incandescent Group, now resides at Hadfield House, Eccleshall Road South, Sheffield, 11 (tel. Sheffield 65927). He is available to deal with enquiries concerning fuel fired and electrically heated furnace equipment, and will continue to be of service to users of such plant. The companies which he represents are: The Incandescent Heat Co. Ltd., Metalectric Furnaces Limited, Controlled Heat & Air Limited, and Selas Gas & Engineering Co. Ltd.

Modernisation of Inverness Passenger Station.—The first phase in the Scottish Region plans for the modernisation of Inverness passenger station has been completed by the opening of a new ladies' waiting room. Work is now being commenced on a new cafeteria and bar and left luggage office.

Part of British Transport Advertising window display at the headquarters at Leicester Square Station, London Transport

Forthcoming Meetings

Open currently and until further notice.—British Transport Commission: Historical Exhibition "Transport Treasures," in Shareholders' Meeting Room, Euston Station, from 10 a.m. to 6 p.m. on weekdays, and 2 to 6 p.m. on Sundays. Admission 6d.

January 4 (*Fri.*).—The Railway Club, at 57, Fetter Lane, London, E.C.4., at 7 p.m. Paper on "Some thoughts on steam rail motors," by Mr. R. K. Kirkland.

January 5 (*Sat.*).—Stephenson Locomotive Society, Midland area, at the Imperial Hotel, Birmingham, at 7 for 7.30 p.m. Tenth anniversary dinner.

January 7 (*Mon.*).—Institute of Transport, Metropolitan Section, at 80, Portland Place, London, W.1., at 5.30 for 6 p.m. Paper on "Transport of paper," by Mr. R. Neville White, Bowaters Services & Transport Limited.

January 7 (*Mon.*).—Historical Model Railway Society, at the headquarters of the Stephenson Locomotive Society, 32, Russell Road, London, W.14, at 7 p.m. Selection of photo slides, by Mr. O. P. Wilman.

January 7 (*Mon.*).—Institute of Transport, Scottish Section, at the Grosvenor Restaurant, Glasgow, at 6.30 for 7 p.m. Annual dinner and visit of the President.

January 8 (*Tue.*).—Institute of Transport, North Staffordshire Group, at the Grand Hotel, Hanley, at 6.30 p.m. "An Austrian rail miscellany," by Major C. S. N. Walker.

January 8 (*Tue.*).—Institute of Transport, Leeds & Bradford Section, in the British Railways Social & Recreational Club, Ellis Court, Leeds City North Station, at 7 p.m. Illustrated paper on "Transport problems of the Rhodesias," by Mr. A. Forester Fielding.

January 8 (*Tue.*).—Institute of Transport Yorkshire Section, at the Great Northern Hotel, Wellington Street, Leeds, 1., at 6.30 p.m. Annual dinner and visit of President.

January 8 (*Tue.*).—Permanent Way Institution, Leeds & Bradford Section, in the British Railways Social & Recreation Club, Leeds City North Station, at 7 p.m. Paper on "Transport problems of the Rhodesias," illustrated by lantern slides, by Mr. A. Forester Fielding.

January 9 (*Wed.*).—Institution of Locomotive Engineers, at the Institution of Mechanical Engineers, 1, Birdcage Walk, London, S.W.1., at 5.30 p.m. Informal film evening at the British Council cinema, Hanover Street, London, W.1.

January 9 (*Wed.*).—Institution of Railway Signal Engineers, York Section, at the Signalling School, Toft Green, York, at 5.30 p.m. Paper on "Line capacity

with special reference to railway signalling," by Mr. W. L. Cartwright.

January 9 (*Wed.*).—Permanent Way Institution, London Section, at the Headquarters of the British Transport Commission 222, Marylebone Road, London, N.W.1., at 6.30 p.m. Paper on "Work Study," illustrated by lantern slides, by Mr. R. W. Bailey.

January 9 (*Wed.*).—The Newcomer Society, at the Iron & Steel Institute, 4, Grosvenor Gardens, London, S.W.1., at 5.30 p.m. Paper on "The Crampton Locomotive: Part II," by Mr. P. C. Dewhurst.

January 11 (*Fri.*).—Stephenson Locomotive Society, Scottish Section, at 25, Charlotte Square, Edinburgh, at 7.30 p.m. Paper on "Carriage workings," by Mr. W. Connolly.

January 11 (*Fri.*).—Railway Correspondence & Travel Society, London branch, at the Railway Clearing House, Eversholt Street, London, N.W.1, at 7.15 p.m. Paper on "Train numbering," illustrated by lantern slides, by Mr. A. Wilson.

January 11 (*Fri.*).—Institute of Transport, Northern Section, at the Royal Station Hotel, Newcastle, at 7 p.m. Paper by Sir John Benstead.

January 12 (*Sat.*).—Permanent Way Institution, East Anglia Section, at Norwich, at 2.15 p.m. Paper on "Duties of a permanent way inspector," by Mr. E. A. Haxley.

January 14 (*Mon.*).—Institute of Transport, at the Jarvis Hall (R.I.B.A.), 66, Portland Place, London, W.1., at 5.45 p.m. Paper on "Some problems and practices of the parcels carrier," by Mr. R. L. H. Farmer.

January 15 (*Tue.*).—Railway Correspondence & Travel Society, East Midlands Branch, at the N.C.S. Guild Room, Toll Street, Nottingham, at 7.30 p.m. Illustrated paper on "North East London branches and the Isle of Wight, 1956," by Mr. J. R. Bouser.

January 15 (*Tue.*).—Institution of mechanical Engineers, at 1, Birdcage Walk, Westminster, S.W.1, at 6.45 p.m. Internal combustion engine group discussion "Is there a future for the diesel engine in combination with the gas turbine?"

January 16 (*Wed.*).—Railway Students' Association, at the London School of Economics & Political Science, Houghton Street, London, W.C.2, at 6.15 p.m. Paper on "The oil industry in relation to transport," illustrated by films, by Mr. A. G. Taylor, manager, Inland Distribution Department, Esso Petroleum Co. Ltd.

January 16 (*Wed.*).—Institution of Railway Signal Engineers, London Section, at the Institution of Electrical Engineers, Savoy Place, London, W.C.2, at 6 p.m. Paper on "Communications as applied to railways," by Mr. D. M. Clarke.

January 17 (*Thu.*).—Stephenson Locomotive Society, at Caxton Hall, Westminster, S.W.1., at 6.45 p.m. Mr. H. Holcroft, formerly Assistant Chief Mechanical Engineer, S.R., will describe "Experiments with S.R. 2-6-0 engine A816."

January 17 (*Thu.*).—Diesel Engineers & Users Association, at the Caxton Hall, Westminster, London, S.W.1, at 2.30 p.m. Paper on "World supplies of oil," by Mr. M. E. Hubbard.

January 17 (*Thu.*).—Model Railway Club, at Caxton Hall, Westminster, London, S.W.1, at 7.45 p.m. Talk on "The L.N.W.R.," by Mr. G. H. Platt.

January 19 (*Sat.*).—Stephenson Locomotive Society, North Eastern area, at the Griffin Hotel, Leeds, at 6.30 p.m. Paper on "Locomotives of the Caledonian Railway," by Mr. A. J. Thorn.

January 21 (*Mon.*).—At the Dorchester Hotel, Park Lane, W.1, (Ballroom entrance), at 12.30 for 1 p.m. luncheon in honour of Mr. Roy Hacker, Chief Officer (Continental), Railway Executive, on his retirement.

Railway Stock Market

Stock markets started the new year cheerfully under the influence of news of the programme for clearing the Suez Canal, though it is feared that it may be six months before oil shipments from the Middle East can be restored to normal. A factor which has helped stock markets a good deal, and which was responsible in a large measure for the improved trend in British Funds, has been widespread talk that the next change in the Bank rate, when it comes, is likely to be downwards rather than upwards. On the other hand there is general recognition that it is very hard to form a definite view yet awhile, and that the Budget will probably have to be awaited as an important indication of the economic position and outlook. The recent good rally in markets has arisen from a moderate amount of buying; but it had a predominating influence, as markets are inclined to be short of stock because of the small amount of selling in recent weeks.

There was slightly more business passing in foreign and other railway stocks. Antofagasta ordinary stock was well maintained at 31½ at which there is a yield of 12⅞ per cent on the basis of last year's 4 per cent dividend, while, the 5 per cent preference stock, which was again around, 45½, yields 10⅞ per cent.

Compared with a week ago, United of Havana second income stock has moved up a point to 45½ with the consolidated stock also higher at 6½. Mexican Central "A" bearer debentures were again 70½. San Paulo Railways 3s. units were again quoted at 3s. 1½d. Chilean Northern 5 per cent first debentures have been steady at 47½xd, while in other directions, quotations for Dorada ordinary stock and debentures remained at 50½ and 105½ respectively. Costa Rica ordinary stock was 24 and the 6½ per cent first debentures 76. Brazil Railway bonds have remained at 6.

Guayaquil & Quito assented bonds have strengthened to 77½. In other directions, Nitrate Rails shares were 20s. and Taltal shares kept around 12s. while Paraguay Central prior debentures were again quoted at 15, but few foreign rail stocks have been tested by dealings. Elsewhere, International of Central America common shares kept at $34½, while the quotation for the gold bonds was again £175⅛.

Canadian Pacifics were affected by the strike threat, and receded to $64¾, but both the preference stock at £58½ and the 4 per cent debentures at £65½ have been firmer. White Pass shares strengthened from $20¾ to $21¼.

Midland of Western Australia stock again had a quotation of 8½. Emu Bay 4½ per cent debentures were 57½.

A pleasing development was a better trend in shares of locomotive builders and engineers, which responded to a little buying. There now seems wider recognition that they are moderately priced compared with many other groups of shares. Compared with a week ago Beyer Peacock, for instance, have rallied to 34s. at which there is, however, still a yield of over 9 per cent. Charles Roberts 5s. shares were 10s. 7½d. at which the yield is 7 per cent on the basis of last year's 15 per cent dividend. At Glasgow, Hurst Nelson were 38s. to yield not far short of 8 per cent. North British Locomotive were 11s. 4½d., and elsewhere, Birmingham Carriage were 14s. 3d. at which there is a yield of over 14 per cent on the basis of last year's 10 per cent dividend. Wagon Repairs 5s. shares were 11s. 3d. and Gloucester Wagon 10s. shares also 11s. 3d. Westinghouse Brake rose 1s. to 72s. Yield in this case is only 5 per cent, but last year's 18 per cent dividend was earned nearly three times over.

A feature has been a strong rally in shares of electrical equipment companies. Compared with a week ago, Associated Electrical have moved up from 65s. 3d. to 66s. 3d., General Electric from 48s. to 50s. 3d. and English Electric from 46s. 9d. to 48s. 6d. Elsewhere, Babcock & Wilcox rallied from 72s. to 74s. 6d. and Vickers from 40s. 10½d. to 42s. 6d. Broom & Wade 5s. shares rose to 12s. on the higher dividend and proposed acquisition of Holman Bros. Guest Keen have moved up to 46s. 9d. and Tube Investments to 58s. 9d. Powell Duffryn have been a good feature up to 23s. and B.S.A. rallied to 21s. 6d. Steel shares also were better, the good yields bringing in buyers. Stewarts and Lloyds were 61s. 6d.

OFFICIAL NOTICES

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